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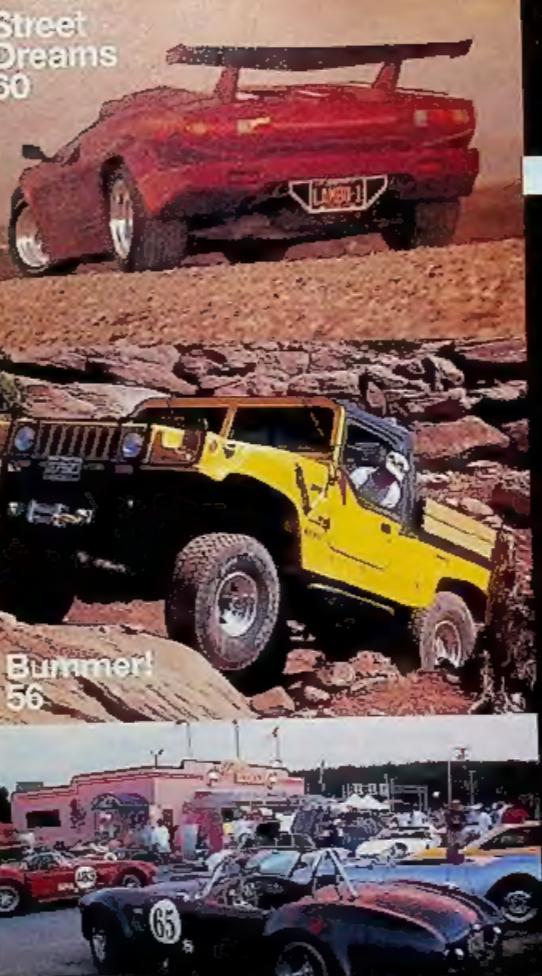


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16

departments

Driver's Side

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News and views important to the kit car world

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Cool products for cool cars

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Readers' rides

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KIT CAR

THE CAR BUILDER'S AUTHORITY

JULY 2001 • VOLUME 20, NUMBER 4

features

Cobra Parts Buyer's Guide

New and unique additions for any snake

(Not So) Loud in Louden

Kit cars roar at the Northeast Replicar Challenge

Club Sandwich

Annual Laughlin show is more popular than ever

Keith Kaucher's Kit Concepts

Boss 302 Jamaican Tiger

showcase

Express Delivery

The Performance snake was more than an overnight decision

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The Laminar Evolution brings the Europa up-to-date

Bummer!

A kit for the down-and-dirty crowd

Street Dreams

A tale of two guys, and a raging bull of an exotic

how-to

The Tri-Rodster Project

We build three cars in one week

Quad Mods

How to hop-up a Quad 4 engine

Install a Manual Wiper

A quick way to add a windshield wiper and satisfy some safety requirements

Make Side Vents

Our project Devin lets off some steam

technical

Basic Tech: Trailer Tire Safety

How to avoid disasters while towing your kit car

ON THE COVER:

We think Colin Chapman would surely approve of Laminar's Lotus on steroids. This stunner blasts along with the best, pushed by a healthy twin-turbo rotary engine. Photo by Harold Pace. The inset is of another supercar, a big-block Superformance snake that gives new meaning to the term express delivery. Photo by John Steele.



Lotus Extreme



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DRIVER'S SIDE

by Jim Youngs

TAKE MY WIFE, PLEASE...

Adding the jewelry to Carolyn's kit car. You read that correctly—her kit car. And yes, she built it. In the process, I learned what a trophy wife is all about!

PHOTO BY HENRY CARSELLI



I am still kind of reeling and scratching my head and questioning whether my hearing has degenerated as much as some of my other aging senses. My wife, Carolyn, to whom I've been married for 30 years and have known for considerably longer than that—and who I thought I knew fairly well—completely floored me earlier this year by expressing a desire to build her own kit car. Now Carolyn is like most women who consider cars merely as a form of transportation, and aside from a vanity mirror on the visor, a good radio, and a complimentary color, have no interest in items such as cool wheels, the right stance, high-performance goodies, the importance of chrome, the esoteric attributes of mellow exhaust notes, and the intricacies of accessorizing with items from the Motor Equipment catalog.

Along with the rest of us, Carolyn worked her butt off during the build week and did some things she never would have imagined doing. She also learned some things that may perhaps give her some insight into guyland—if not why guys can stand around looking at an engine and discussing the finer points of high performance. She quickly learned why we like buying tools, and why having a lot of tools is not a luxury but a necessity to doing the job properly and efficiently. She became familiar with the operation of a pneumatic ratchet, a Sawzall, a die grinder, and other such serious tools. She singlehandedly wrestled with removing a radiator. She became the resident expert on mixing Vette glue. She sanded, painted, wrenches, cut, ground, and got dirty alongside the guys, and she didn't even grouse too much about not being able to get an arugula salad at lunch or eating fast food dinners at 10 p.m. She even did all that with the handicap of having to wear a knee-high foot brace because of a fractured foot.

Carolyn wanted to build one of these cars for several reasons. She admittedly doesn't understand the attraction of spending days at car shows, so the experience might just provide some clues as to why guys can spend so much time working on and talking about custom cars and all that goes with that experience. With the TajGarage in place at our new house, she didn't want to become a car widow, choosing instead to share in my hobby. She loves the Rodsters. Unlike most of

What a great project the Tri-Rodster build week was, but what made it even more special for me was my spouse allowing me to work alongside her in getting her Rodster on the road. Take me with, please...and use her experience here as an example. You might just look out as I did.

KITCAR

THE CAR BUILDER'S AUTHORITY

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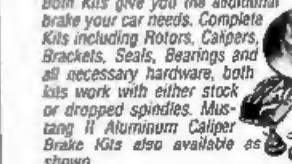
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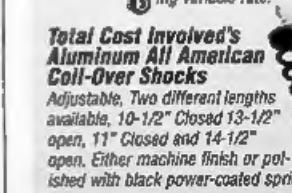
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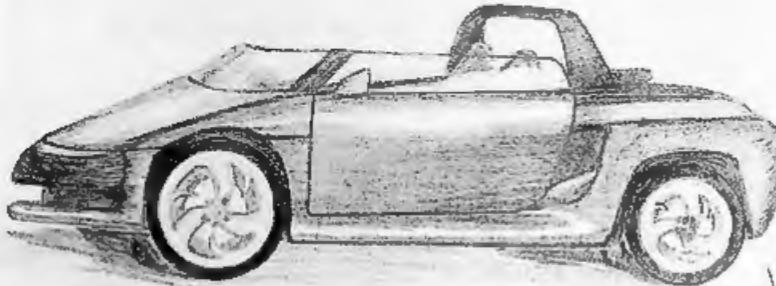


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MAILBOX



FUTURE KIT COMMENT

In reading your editorial "What This World Needs Is..." (Jan. '01, p. 4), I have to say it's time some of the kit car companies—or individuals—come up with just the kit car you were talking about. Really, what's so hard about building just the thing you refer to—mid-engine cars using Hondas, Nissans, and so on—but also any front-wheel-drive powertrains such as Tauruses, Escorts, and all GM brands. It wouldn't matter because all the engine/trans setups would work just fine. The thing is to make the kit affordable and fun to assemble. Use a VW front beam. It's inexpensive and could easily be modified for width, height, and ride—and it has been around forever.

I drew this picture of the '89 Plymouth Speedster concept car that I believe would fill the need you and I are thinking about. It would be simple. A tube chassis could be easily designed to accept any of the cradles for the combo of your choice. I know exactly how I would build it, but I wanted to throw this out to you.

Jimmy Santangelo
Rosharon, TX

Thanks for your drawing and your thoughts on the front-wheel-drive to mid-engine kit cars we've been proposing for the past year or more. Apparently lots of folks are thinking in the same vein since we are beginning to see some new and innovative stuff coming along in this regard.

MORE ON MID-ENGINE CHASSIS

I am writing in response to the Jan. '01 editorial. Mr. Youngs makes the point that there are a lot of late-model powertrains available that would be good candidates to be transplanted into kit cars. For several years I have been offering a chassis that will do exactly that. My chassis can be built to accept a wide variety of engine and transaxle combinations. I build mostly for the kits that were originally designed to be used on a VW pan. I think there is a large number

of these kits out there that would make nice cars if installed on a chassis with a good suspension and a late-model engine and transaxle.

The problem I have run into with this arrangement is that most of the people who are building one of these older kits are working on a limited budget. They have purchased the kit for little money and want to get on the road for not much more. The expense of a late-model engine and the complications of installing the electronics associated with it keeps most people from using these engines. In addition, most people who are

looking to upgrade to something more powerful are wanting to install a V-8.

I have explained to many people that given the light weight of most kit cars and the power available from the modern engines now available, using one of them would be a good way to go. The weight-to-horsepower ratio is such that they will experience good performance with good fuel economy and reliability.

Go to www.priceofhistoys.com/showroom/com/a&e/index.html for some photos and information about two of the chassis I have built. I build each one individually for the customer's application and can modify as necessary to fit the body being used. I can use a wide variety of engine and transaxle combinations. Anyone wanting more information can contact me at the following address.

Eric Martin
A&E Automotive & Machining
1456 N. Brownhill Rd.
Brookville, KS 67425
785/225-6774
aeauto@tri.net

Thanks for the comments and information on your mid-engine chassis. Actually, one of our readers alerted us to your Web site recently and we've just been slow to contact you for more information.

In our ongoing effort of searching for the next generation of kit car products, we will continue to show our readers what's new and innovative. Stay tuned.

MORE ON ASIAN DONORS

I have long been a reader of your magazine and have been fascinated by kit cars. I am from Asia and was wondering why nobody builds kit chassis that use Asian car donors, which are cheaper and more available in this part of the world. I think it's about time kit car manufacturers target the Asian market since the regulation for building cars here is not as strict as in the West. Most exotic cars are so expensive (more expensive than in the West) because of the 100-200 percent taxes. By going for a kit, we could order it unassembled and the taxes would be

lower because you can declare it as spare parts, which carries only a 26 percent tax.

By the way, do you have the address of the company selling the Cobra chassis blueprint? I'll try to build one myself and modify it to take a Japanese engine.

Herbert Laborada
via e-mail

Cobra Restorers (770/427-0020; www.cobrarestorer.com) sells a set of plans for the original 427 Cobra chassis for \$199.95. These include the frame and body substructure and are completely dimensioned. Also, be sure to read the above letters.

AN OPEN LETTER TO CARROLL

I am really pissed off and distressed that my hero and creator of the Cobra is suing Factory Five Racing and Superformance! Carroll, reconsider the lawsuits. You took a British sports car and transformed it into a legend. Are you so hungry for money you have to go after companies that are keeping your legend alive? No one that I know of ever tries to pass off a fake Cobra as a real one. The cars are fiberglass. And the fact that anyone can slap a Cobra or A.C. logo on the car does not make it a real Cobra!

I guess I won't contribute to the Shelby Heart Fund anymore. I have lost respect for you. Shame on you, Shel—you can do better!

John Sanchez
Madera, CA

MARKETING GLITZ

In response to Anonymous' complaints (Jan. '01 Mailbox, p. 6) against various kit manufacturers for not having enough "glitz" in their marketing, I'd rather have the glitz in their products and service than in their catalogs.

If you research the company—not the catalog—you'll avoid a pothole in your kit purchase. Research the company via the Better Business Bureau, the attorney general's office, the Internet, clubs, customers, and so on.

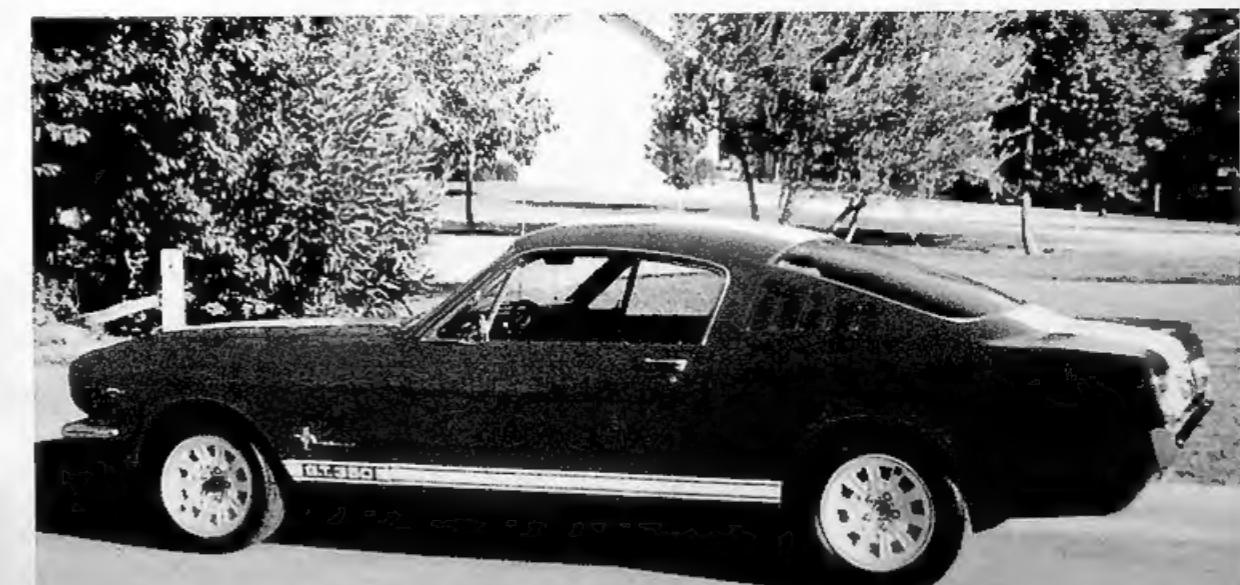
I practiced what I preach and

was rewarded and thrilled to receive my recent kit purchase—a Countach replica—purchased from Alan Schrager at Euro-Works. Euro-Works delivered on every pledge of the company. A top-quality kit, complete shipment, an on-time shipment, and timely communications on the progress. The quality and service were outstanding. The results of my research reiterated these facts. That's why I chose the company.

The result of your research is good business—and not just for you, but also for the companies involved. Happy customers are better marketing glitz than flashy catalogs.

Mike Goyette
Taunton, MA
KC

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My fake Shelby

SPECIALTY SCENE

News and views important to the kit car world

SUIT/COUNTERSUIT

Carroll Shelby and Shelby American have announced a lawsuit against Superformance in federal court asserting trademark infringement, dilution, and unfair competition. The suit charges Superformance with unlawful use of Shelby trademarks and other intellectual property rights. A similar case was filed last year against Factory Five Racing. Both lawsuits allege that the companies manufacture and sell counterfeit copies of the Cobra. Shelby's suit seeks damages and attorney fees that could exceed \$10 million and the destruction of Superformance's molds. Shelby was quoted, "As I said before, credit should be given where credit is due, and these knock-off car guys don't deserve the credit or profit for what my team and Ford accomplished in the '60s."

In response to the Shelby lawsuit, Superformance has filed counter-claims against Carroll Shelby requesting a court order that Carroll Shelby does not own any valid trademark rights that would permit him to prevent the manufacture of replicas of the original Cobra. Superformance has denied all Shelby's allegations and has also requested the court cancel Shelby's alleged trademark registrations on the grounds of their invalidity.

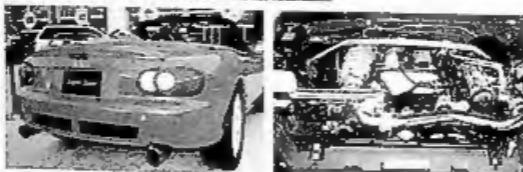
In the 25 years since Shelby ceased building Cobras, an entire industry grew, with dozens of companies replicating the cars in kit form. In published interviews Shelby was quoted as considering the Cobra replica industry as complimentary and stating that he didn't mind folks making copies of "that old car." The counterclaims filed by Superformance state that Shelby and Ford have long since abandoned any rights to the Cobra name, the shape of the Cobra, or the designations associated with the Cobra because of their failure to prevent the widespread use of those names and shapes by replica manufacturers. For more than 24 years, Shelby did not produce or sell Cobras or Cobra replicas and stood silently by as an entire Cobra replica industry evolved with his knowledge and acquiescence.

CONSUMER ALERT!

We have just learned that Vette-Rod/Vintage Vettes and principal David Arthur are under investigation of fraud, and that the company and its Web site have been shut down by the Louisiana attorney general. The action was taken due to complaints to the automobile fraud section of the attorney general's office. Unfortu-

nately, we learned about this action after we published a Specialty Scene piece in the May '01 issue.

We also admit to a goof in the Jan. '01 Kit Buyer's Guide by listing Knight Industries as a producer of Ferrari replica kits. The company does not produce such kits. We're sorry for any misinformation or inconvenience.



ZOOM, ZOOM!

Drawing inspiration from its race-bred sister—the Mono Posto—the Miata MM from Performance West Group features a cool, sculpted, restyling package from California High Performance and the heartbeat of a blown engine. The Mazda mill is supercharged by a Kenne Bell blower and intercooler breathing through low-restriction dual exhaust and belting out a tune through polished megaphones. The car additionally features a lowered suspension by Intrax, and lightweight Volk Racing 17-inch GT-A modular alloy wheels shod with Goodyear Eagle F1 rubber. The cockpit is an intimate mix of Katzkin custom leather upholstery and brushed aluminum trim.

Contact Performance West Group, Dept. KC, 914 Santa Fe, Ste. 101, Vista, CA 92084; 760/630-0547.

SPECIAL RECOGNITION

We just learned that our friend Rich Anderson, president of Shell Valley Companies, was named the 2001 Small Business Person of the Year for the state of Nebraska by the U.S. Small Business Administration. In 1999 Shell Valley was recognized as the Small Business of the Year. The award is based not only on the financial success of the business, but also on its staying power, employee growth, innovation, and creativity. Winners are also selected for their involvement with their communities. Congratulations, Rich!

V-8 PORSCHE

Now under new ownership, Renegade Hybrids is an 18-year-old company specializing in transplanting American V-8 iron into virtually every Porsche model and providing do-it-yourselfer kits for same. In addition, the company offers modified Porsche transaxles for mid-engine kit car builders. Owners Scott Mann and John Petsco tell us Renegade also has adapter plates, custom-fit aluminum radiators, suspension upgrades, chassis components, custom front valances, full body kits, and other components to personalize these Teutonic sports cars. For complete information, contact Renegade Hybrids, Dept. KC, 4640 S. Valley View Blvd., Unit E, Las Vegas, NV 89103; 866/498-2421; www.renegadehybrids.com.

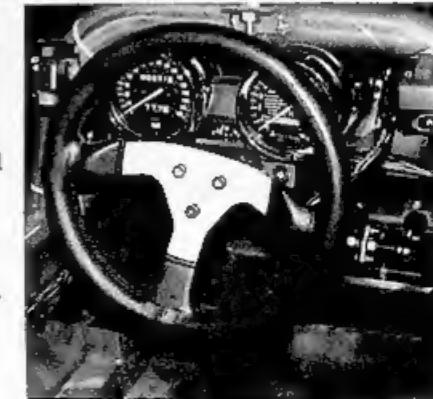
"Despite the cost of living, have you noticed how popular it remains?"

INDYCYLE KIT DEBUTS

Designing a street vehicle that would have race car handling and superbike performance was the goal of Chevrolet's former Assistant Chief Engineer Jim

Musser. Musser formed Knusaga Corporation in 1971 with Bunkie Knudsen to supply tube products—such as exhaust pipes—to DaimlerChrysler, Ford, and Volvo. Knusaga's latest product is the IndyCycle, a \$3,995 complete kit that will transform a donor motorcycle into a single-seater, three-wheeler (cyclecar) with plenty of performance potential. The kit includes everything to assemble a street-legal vehicle except for the donor bike. The kit is designed around a Kawasaki ZX1100, though other superbikes may also be used.

The IndyCycle was designed to be able to be completed over a weekend and be fully road-ready without any special skills. Included in the IndyCycle kit is the CAD-designed chassis, a white gelcoated fiberglass body, cooling ducts, a clutch hose, a pedal assembly, master cylinders, a paddle shift linkage, and a headlight. Motorcycle components such as the donor's turn signals, instrument cluster, wiring harness, and such are reused and repositioned. Contact Knusaga Corporation, Dept. KC, 2073 S. Almont Ave., Imlay City, MI 48412; 810/724-7658; www.indycycleonline.com.



ulti•mate (ul'ü-të-mit) adj: most extreme; greatest

qui•n'es•sen•tial (kwin'ë-sëñ'ë-shël) adj: being the purest or most characteristic.

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"The sooner you fall behind, the more time you'll have to catch up."



Dick Kvetnansky (left), president of K-1 Styling, and Jim Crabtree ink a new business partnership for exclusive U.S. representation.

EVOZIONE GETS NEW US AGENT

K-1 Styling has announced the appointment of Jim Crabtree (Classic Replicars) as its new U.S. representative for the Slovakia-built Evoluzione kit and turnkey vehicles, as well as future products. To bring the company more in line with the modern image of the new cars, Crabtree has also changed the name of his company to K-1 Styling USA.

Crabtree is no newcomer to the kit business, having spent several years as a custom builder offering turnkey Factory Five Racing Cobra replicas and Roadsters. He also built a pair of Evoluziones.

By the time you read this, K-1 will have introduced a new car at the Carlisle show. Called Attack, this awesome new sportster is a mid-engine roadster employing a Japanese front-wheel-drive package among other high-tech components. And that's just the beginning, we understand. Stay tuned for more details.

Contact K-1 Styling USA, Dept. KC, 301 (rear) Henderson Ave., Cumberland, MD 21502; 301/722-0740.

ALAMO NAMED WESTFIELD DISTRIBUTOR

Alamo Sports Cars has been named as distributor for Westfield Sports Cars of England. Alamo will offer the complete line of Westfield roadsters, including the traditional four-banger cars, V-8-powered super cars, and the new motorcycle-powered vehicles. All the Westfield models are based on the company's spaceframe chassis and share fully independent suspension systems.

Westfield's superbike-powered Mega cars offer stunning performance and will be offered in both street and race versions. Westfield has produced 6,000-plus vehicles in both kit and turnkey form since its founding more than 18 years ago.

Alamo has a long history of involvement in high-performance, racing, and fabrication services. It is also a Shelby American dealer. Contact Alamo Sports Cars Ltd., Dept. KC, 3107 Broadway, San Antonio, TX 78209; 210/824-5390; www.alamosportscars.com.



FIERO COMPONENT PRODUCTION TO CONTINUE

Held Motorsports has purchased the exclusive manufacturing rights, tooling, jigs, and production capabilities from Ryane Motorsports for Fiero-based products. New owners Mike and Dave Held will be manufacturing and marketing the suspension, brake, and engine-cradle components—under the Held Motorsports name—to the Fiero and kit car markets. Both principals have considerable experience in manufacturing, engineering, and kit car building, and they plan to not only be a supplier of parts, but also to be a resource. For product information, contact Held Motorsports, 321/868-1832; www.heldmotorsports.com.

MARK YOUR CALENDAR

June 2-3: 8th Summer Get-Together, Pleasanton Fairgrounds, Pleasanton, CA. All years cars and trucks. Swap meet, car corral. Goodguys, 925/838-9876; www.good-guys.com.

June 8-10: 13th Hot Rod Nationals, Indianapolis Raceway Park, Indianapolis, IN. Race cars, customs, and classics through '72. Drags, show, exhibits, swap meet. Goodguys, 925/838-9876; www.good-guys.com.

June 23-24: Double Venom Spring Fling, Classics by Elite, London, OH. Fund-raiser for Team Jenny and cystic fibrosis. Show, drags, raffles, silent auction, food, door prizes, and a police-escorted convoy through Columbus. Information and registration: 740/852-5280; <http://www.quickkeys.com/springfling/default.htm>.

July 6-8: 10th Heartland Nationals, Iowa State Fairgrounds, Des Moines, IA. Rods, customs, classics through '64. Goodguys, 925/838-9876; www.good-guys.com.

July 7: Club Sandwich Central Kit Car Show, City Park, Collinsville, IL. Info: Don Shank, 618/344-5698.

July 13-15: 4th Goodguys Nationals, Ohio Expo Center/Ohio State Fairgrounds, Columbus, OH. Rods, customs, and classics through '72. Goodguys, 925/838-9876; www.good-guys.com.

July 28: 10th Annual Punkintown Car Show, New Salem Fire Department, Voorheesville, NY. Hosted by the Empire State Specialty Car Association. Dash plaques, door prizes, awards. Info: 518/237-0784.

September 8-9: Handcrafted Automobile Concours, San Leandro Marina, San Leandro, CA. Hosted by the Northern California Kit Car Club. Show, awards, banquet. Info: 510/471-6411.

Definition: Percussive Maintenance—The fine art of whacking the hell out of something to get it to work again

REVIEWS

The Deserter Book
by Alex Dearborn

One of the neatest dune buggies of all times was the Deserter, built first by the Dearborn Automobile Company and later by Autodynamics in the '60s and '70s. The Deserter GT was a great VW-based buggy, while the GS was a mid-engined terror usually powered by the Corvair six. The man we can thank for these great kits is Alex Dearborn, who has recently put together this nifty, 90-page, spiral-bound book on the Deserters, including rare photos, magazine articles, ads, history, and even assembly manuals for the GT and GS. Although specific to the Deserters, the manuals might prove helpful to those in need of instructions for orphan buggies. Seeing the photos of road-racing buggies dicing with Lola T-70s was worth the price of admission for me! Check it out on the Deserter Web site www.deserter.com or call 978/887-6644. \$30. —Harold Pace

How to Modify Volkswagen Beetle Suspension, Brakes & Chassis for High Performance
by James Hale

This informative, 128-page how-to manual is full of useful information for builders of VW-based kit cars. Although published in England—where the VW cult is alive and thriving—most of the suppliers mentioned are American companies so the information is useful no matter which continent you're on. Although virtually every aftermarket performance part is covered, there are still some strange omissions, such as modifications to add camber to the front end. Still, anyone wishing to add disc brakes, lower the front end, or shorten the floorpan (for dune buggies, and so on) should pick this one up. By the same author as *The Dune Buggy Handbook*, Veloce Publishing (www.veloce.co.uk). ISBN 1-901295-80-X. \$24.95. —Harold Pace

The Tin Man Demonstrates: 4130 Chromemoly Airframe Construction
by Kent White

Kent White, a.k.a. "The Tin Man," has put together a fine two-tape video explaining how to fabricate and assemble a tubular steel airframe for

a kit airplane, which is similar to a spaceframe kit car. We get lots of letters from readers who want to build their own tube chassis and fabricate their own suspension, and these tapes should be invaluable to them.

Whether you are using mild steel or chromemoly, White's techniques for shaping tubes, quickly making simple jigs, bending tubes to fit, and welding the whole thing together will speed things up and result in safer,

stronger projects. White brings in three Technical Counselors from the Experimental Aircraft Association who share their expertise as well. You get more than 4½ hours of instruction guaranteed to keep you on the edge of your seat (and put your spouse to sleep at the same time). Highly recommended for the hands-on fabricator. TM Technologies (www.tinmantech.com), 530/292-3506. \$70. —Harold Pace

KC

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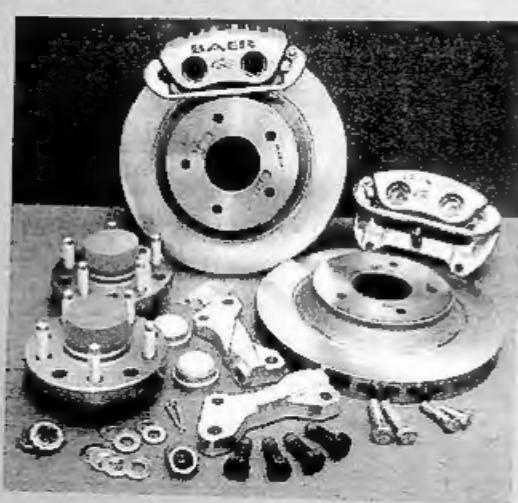
Westwood Publishing

Box 162, Haverford, PA 19041
www.kitcarmarket.com

Outside the USA:
add \$2

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add \$15

COBRA PARTS BUYER'S GUIDE



STOPPING POWER

The engine always receives special attention when building a car, but what good is all that power if you can't get the dang thing stopped. Baer Brakes has a whoosh system for the way you want to drive. The company makes a kit for Cobras that uses the Mustang II suspension. Designed to fit most 16-inch wheels, the kit's vented rotors offer significant weight savings while reducing stopping distances compared to the stock brake system. The light-weight aluminum caliper utilizes Pad Guided Caliper (PGC) technology. An iron anchor plate bolts rigidity to the spindle and saddles the rotor. It's machined to locate the brake pad. The pad locks in its position parallel to the rotor surface, thus minimizing pad taper and allowing the pad to grip the rotor better. The resulting braking performance gives you a tremendous margin of safety. The aluminum hubs add to the reduction in rotating weight, which also reduces stopping distance by reducing the moment of inertia.

Baer Brakes

Dept. KC

3108 W. Thomas Rd., Ste. 1201
Phoenix, AZ 85017
602/233-1411
www.baer.com



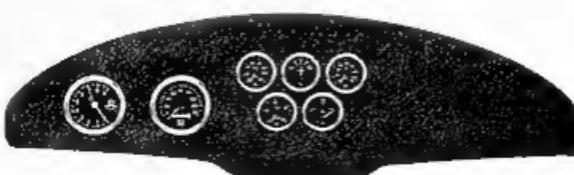
ORIGINAL ORIGINALS

Obviously Shelby American has original Cobra parts, many of which will fit on snake replicas. For instance, the original seats are available in leather or vinyl and give a look of authenticity to any Cobra replica. Replacement fiberglass hoods, trunks,

New and unique additions for any snake

text and photos by Robert Eckhardt

A buyer's guide is a quick way to see what new parts are available for your kit car. Though we can typically only show a small amount of items from each company, rest assured there are many more products out there to help you improve your car. We are constantly on the lookout for new stuff, so read on. You might just discover that must-have accessory for your snake.



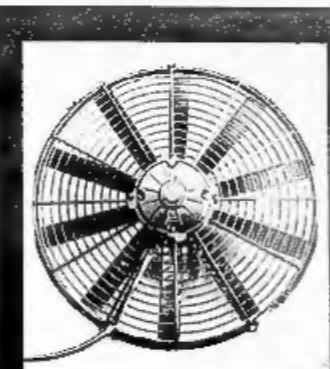
CORRECT GAUGES

XKs Unlimited Motorsport offers the same Stewart Warner Deluxe gauges that were used in the early Cobras. The company also has six other styles of gauges in case you want to modernize your car. Gauges are available as kits or you can order them individually. The kits include a tach, a speedometer, oil pressure, temperature, fuel, and water temperature gauges, and an amp meter. They all come with the sending units and are ready to slide into the dash. The minor Competition style gauges are 2 1/2 inches in diameter and the Street models measure 2 1/4 inches. Most of the gauges are available in electrical and mechanical versions. Electrical gauges are easier to hook up but do not respond immediately.

XKs Unlimited Motorsport
Dept. KC
850 Fiero Ln.
San Luis Obispo, CA 93401
800/444-5247

and door skins for 427 and 289 cars may or may not fit your kit car. It depends on how closely your kit car's body follows the original car. There are many other parts available such as foot pedals, differentials, headlight rings, and driveshaft loops that may appeal to the enthusiasts.

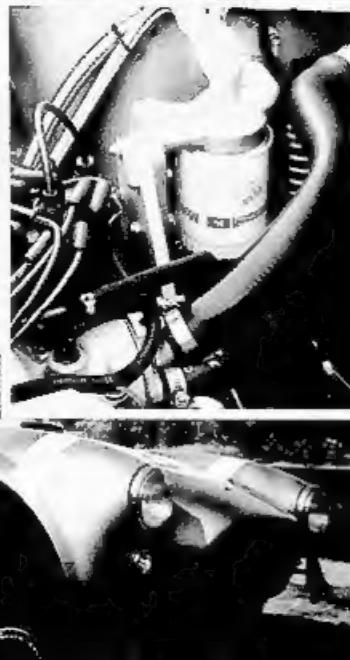
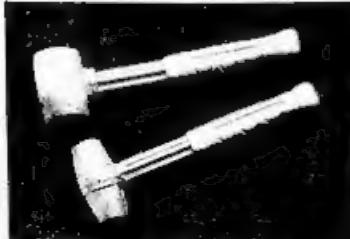
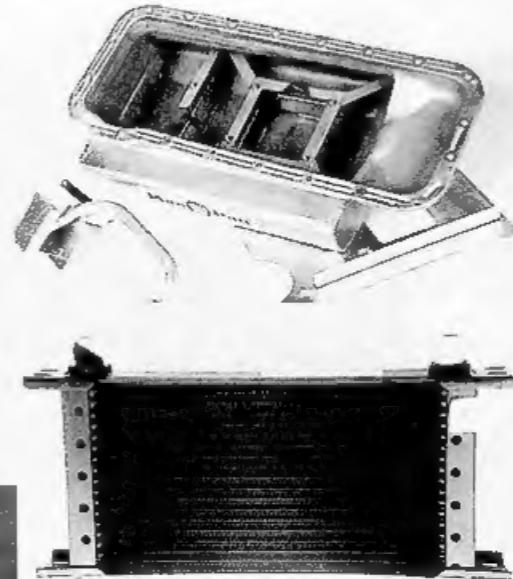
Shelby American
Dept. KC
6755 Speedway Blvd.
Las Vegas, NV 89115
702/643-3000
www.shelbyamerican.com



BLOW ME DOWN

An electrical fan is the perfect way to add additional cooling to a big high-performance engine. For more than 40 years, SPAL Advanced Technologies has been a leading manufacturer of automotive OEM and aftermarket products. The company makes push and pull fans from 5.2 inches up to 16 inches, with airflow ranges from 248 to 2,360 cfm. When selecting a fan for your application, choose one that provides the greatest coverage of the radiator core. If space is available, a puller type fan is more efficient. Generally, straight-blade fans will provide greater airflow. Curved-blade fans operate more quietly and are better for street use.

SPAL Advanced Technologies
Dept. KC
512 Tuttle St.
Des Moines, IA 50309
800/345-0327
www.spal-usa.com



A LITTLE BIT OF EVERYTHING

Besides being a distributor for Unique Motorcars, Operations Plus has an extensive inventory of parts available for original and Cobra replicas. The Man Pan has one-way trap doors and baffles to confuse the oil into staying in the sump. The windage tray traps the oil at the bottom of the pan. This pan is a necessity for any owner who motors through turns at the limit. There are pans for the Ford 289, 302, 351 Cleveland and Windsor, and the 390 and 427 FE engines.

The only time you want oil to escape from the engine is when it goes to the oil cooler. The Swedish Setrab oil coolers set the standard for removing heat from the oil. These coolers come in a variety of sizes and core widths. Space is tight in a Cobra, so using the most efficient oil cooler is a necessity if you want your engine to live.

Using a remote oil filter offers many advantages. It's easier to change the filter, so there's no mess on the garage floor. And, it increases the oil capacity of the engine by filling the lines with extra oil.

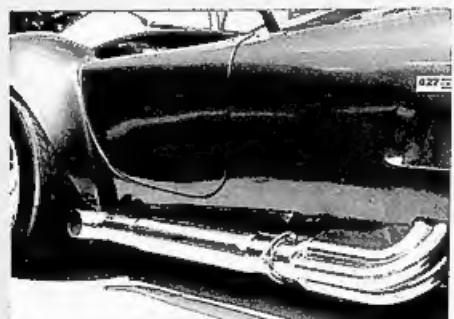
Operations Plus has the Dralle remote oil-filter system. It consists of an aluminum filter housing, a lower block fitting, and an upper adapter plate that attaches to the water-pump housing. All the fittings are either AN 10 or AN 12.

When changing knock-off wheels it's important to use the correct hammer. American Striking Tool AST Babbitt hammers are what you need. These hammers will not mar the knock-offs. They come in 4- and 6-pound versions.

To give a car a racer look, you need to have numbers on it. Instead of using stick-on meatballs or painting on numbers, use static-cling vinyl appliqués. These reusable and removable products will not come off at speed or in the rain. Meatballs, numbers, vintage decals, and class letters are all available. When ordering, also get the storage backer so the vinyl remains flat and does not tear.

Operations Plus
Dept. KC
P.O. Box 26347
Santa Ana, CA 92799
714/962-2776
www.cobracountry/opsplus.com

COBRA PARTS BUYER'S GUIDE



STAINLESS STYLE

Sidepipes on a Cobra speak authenticity. When they are handcrafted of 304 stainless steel by craftsmen such as the folks at Stainless Specialties, they'll last a lifetime. You'll find patterns for the original Cobra, ERA, Classic, and Contemporary kits among others. The company can also make custom sets such as those shown here with a three-bolt flange. The customer

wanted pipes with a disconnect so he could remove the muffler portion of the pipe when he was racing. The pipes come with the muffler built inline. They have a variety of different muffler styles and designs so you can customize your car.

New from Stainless Specialties is its "Smoothie" Coolant Recovery tank. Made of 304 stainless, it incorporates a flush-fit top cap. It keeps the coolant level in the radiator full and is fully show polished. The standard tank measures 3x12 inches and custom lengths are available. There's also a similar-looking Smoothie power-steering reservoir. It's 3x6 inches and holds enough fluid for any power-steering system.

Stainless Specialties
Dept. KC
P.O. Box 781035
Sebastian, FL 32978
561/589-4190



VINTAGE WHEELS

Having the correct wheel in the wheelwell is important to the look of every Cobra replica. PS Engineering has been making nostalgic and vintage racing wheels since 1988. The company prides itself on the period-correct design and absolute top quality of its T-6, one-piece, aluminum wheels for the 289 FIA and 427 SC Cobras. The polished tri-spoke is correctly shaped in every detail. PS has 15x7.5 and 15x9.5-inch wheels, which are standard. Also available are 16x8 and 16x9.5 sizes.

PS Engineering
Dept. KC
2675 Skypark Dr., #102
Torrance, CA 90505
310/534-4477

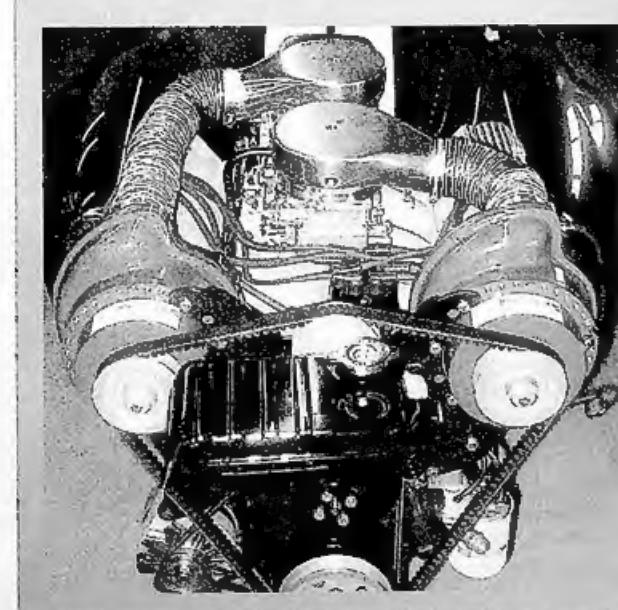
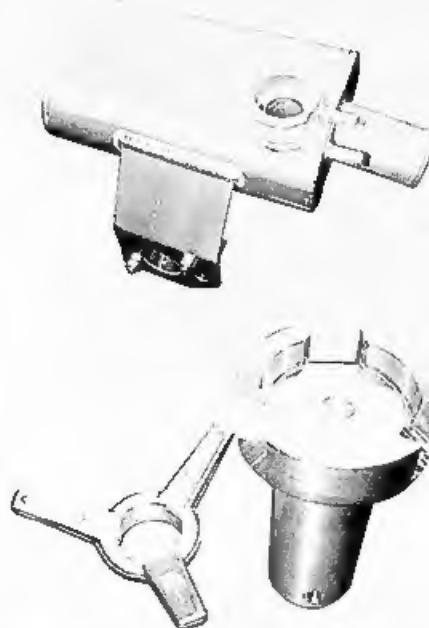
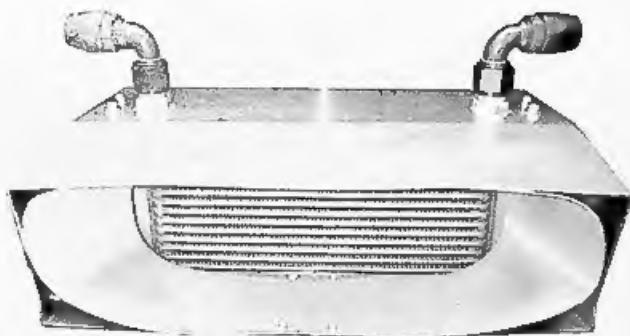
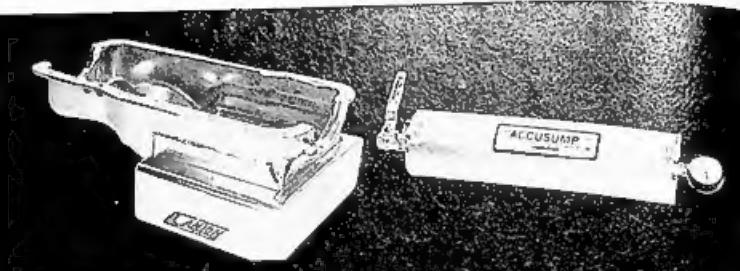


POTS AND PANS

A constant supply of oil is critical for any engine but especially for a high-performance kit car motor. There are two ways to be sure an engine receives all the oil it demands. First, the oil must always be available at the oil pickup in the oil-pan sump. To ensure this, an aftermarket road-racing pan such as this one from Canton Racing Products is the answer. The oversized sump increases oil capacity to 9 quarts, which allows the oil to run cooler. With special diamond-shaped baffling and four trap doors, the oil is held in the sump at all times. These pans are not only for road racing, but are also excellent for drag racing and everyday aggressive driving. As with any pan you must match the oil pickup, the oil pump, and chassis layout to the pan. The model 15-630 is perfect for small-block Ford applications.

The second way to ensure that oil is always in the engine is to use an oil accumulator. The original unit came from Accusump. It holds oil under pressure in a storage cylinder that releases the oil to the engine when there's a drop in the engine-oil pressure. It acts as a reserve oil supply. It's an excellent way to pre-pressurize the engine before starting the motor. Fifty percent of engine wear occurs at startup because the oil pressure is not established until the engine is running. With the Accusump, you pressurize the system before starting the engine.

Canton Racing Products
Dept. KC
232 Branford Rd.
N. Branford, CT 06471
www.cmfilters.com



ORIGINAL MADE BETTER

One of the advantages to owning a kit car versus an original is that many of the parts can look like the original but are newer and better. Such is the case with a number of new products from Finish Line. The company offers an aluminum radiator expansion tank made just for the 351 and other small-block Ford motors. The Harrison tank made for the 289 motor is too small and the 427's brass tank has the flanges in the wrong spots. On the 351 motor, the tank had to be cut and rewelded to make it fit. This new tank bolts right on.

The tri-spoke spinner on the wheel makes any Cobra look great. The problem is that hammering the spinner on and off the wheel has led to damaging it and the wheel. On deep-dish wheels, you must

hammer at an angle—not perpendicular to the spinner arm. A bent spinner is the normal result. The answer to this problem is a new tool from Finish Line. Copied from an original handmade tool found in the GT40 race pits, this new aluminum billet tool is machined to fit over the three ears of the spinner, while at the opposite end is an opening for a 1-inch breaker bar. Putting on and taking off wheels is now quick, and you can torque the wheels so you know they're tight.

Keeping snake motors cool takes more than a good radiator. It also requires a good oil cooler. One of the properties of the oil—besides providing lubrication—is to remove heat from the engine. The original Mocal oil cooler has 16 rows of cooling tubes to ensure heat removal. This unit is powdercoated silver for years of good looks. The aluminum shroud is the same as originally used on the racing Cobras. It channels the air to the oil cooler. The last part of this system is the two polished fans. They are 9 inches in diameter and push 750 cfm each. The fan kit comes with two electric motors, mounting brackets, cables, looms, and a Lucas 2 position switch.

Finish line has more than 180 parts for most Cobras. It also handles the Moto-Lita line of steering wheels.

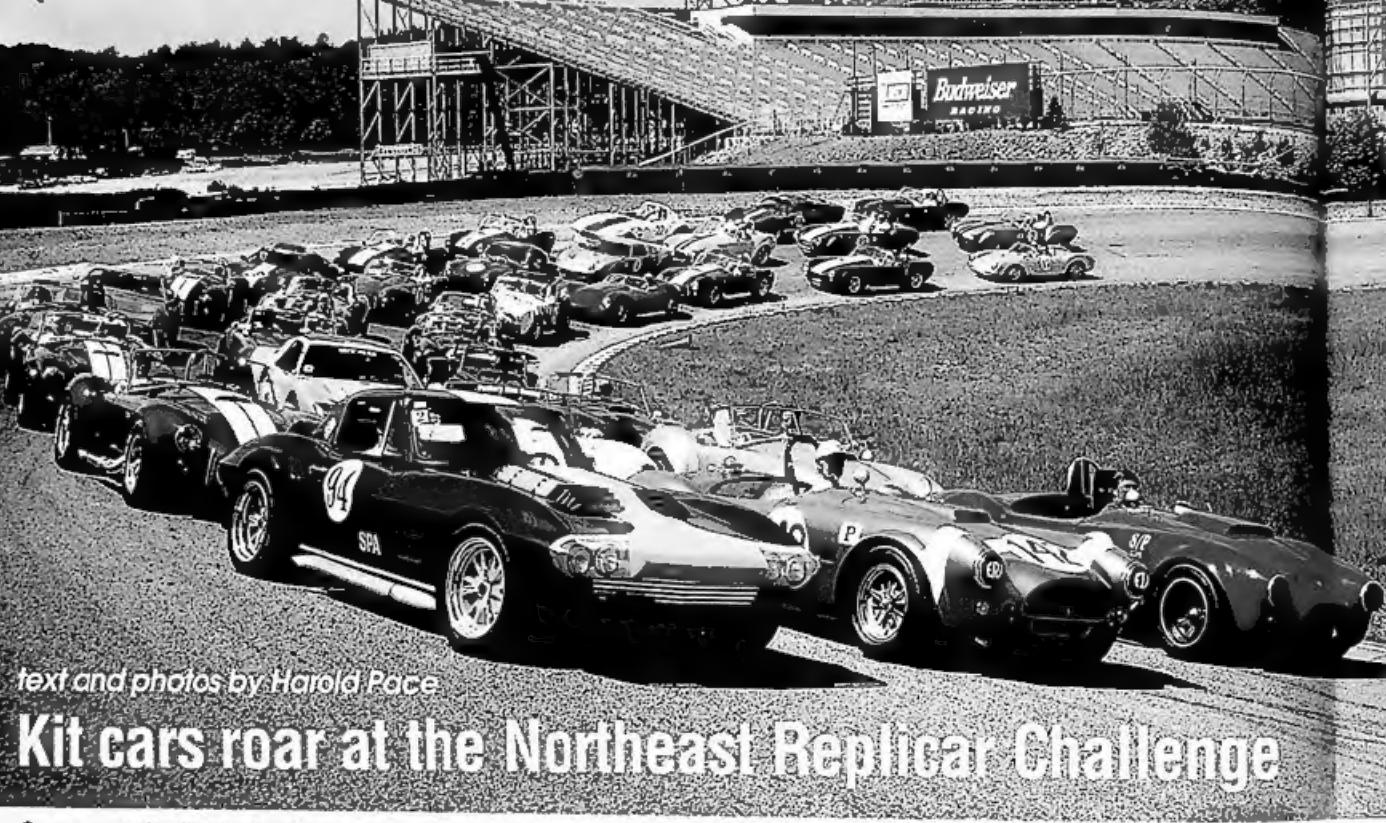
Finish Line
Dept. KC
3593 SW 173rd Ter.
Miramar, FL 33029
888/436-9113

TWIN SUPERCHARGER KIT

Cobra Automotive has announced a new twin Paxton Supercharger kit for Ford FE engines patterned after the legendary Bill Cosby Cobra of the '60s. The twin Paxton kits are supplied with all mounting brackets and hardware, a specially built 172-gph ultra-high-volume fuel pump, a blower boost, fuel-pressure gauges, and a set of instructions. The company claims that an "average" 427/425hp big-block will jump to 575-600 hp with the kit in place and running only 5 pounds of boost.

Cobra Automotive
Dept. KC
37 Warehouse Point Rd.
Wallingford, CT 06492
203/284-3863
www.cobraautomotive.com

(NOT SO) LOUD IN LOUDEN



text and photos by Harold Price

Kit cars roar at the Northeast Replicar Challenge

Group portrait with Tim Lewis' D&D Grand Sport, Joe Rodomista's ERA FIA, and Don Durner's ERA 427S/C on the front row

SCHOOL TIME

Event organizer Joe Traut firmly believes the key to safe, fun events is to have a staff of experienced instructors showing the ropes to the new drivers—or helping the more experienced ones hone their skills. He was appalled at another well-publicized kit car event he attended where completely inexperienced drivers were turned loose on a high-speed track without so much as a word of instruction (with dire results). The Replica Challenge is sanctioned by the COM Sports Car Club, which puts on time-trial events for a variety of mostly street-driven cars at locations in the Northeast. Time trials provide the opportunity to really open 'er up without the extra concerns and safety equipment that wheel-to-wheel racing require.

Chief instructor Dean Clark began the day with a classroom session, stressing the importance of taking the correct line, looking ahead, and watching for the flags the corner crews use to convey information. Clark then paired students up with instructors for on-track instruction. The instructors drove the students around and showed them the lines, then rode shotgun and kibitzed. Quickly their students' lines improved and became more consistent, and confidence levels began to rise.



Champ Don Durner flings his ERA down off the banking.



Bruce Allen's Viking was nimble in the autocross.

For the third year running, Joe and Nicole Traut, Bruce LeDoux, and a host of helpers put on a splendid event for kit cars in the beautiful woods of Louden, New Hampshire. Thirty-six cars made the trek and were treated to an autocross, a driver's school, a rally, and a high-speed track event. And despite the best efforts of noise-conscious neighbors and Mother Nature, the event was a success.

The entry list was more diverse than in years past, with two Spyders, three GT40s, two Vette Grand Sports, and a Viking, as well as replicas of virtually every Cobra variant. The usual suspects from past years returned, with previous champions Bruce Allen and Jesper Ingerslev ready to rumble, along with a host of challengers.

Due to the difficulty of reserving a racetrack for a weekend, the event kicked off on a Monday with events organized by LeDoux. In order to broaden the appeal beyond just the track event, a challenging autocross was put on with help from the Baystate Corvette Club. The only snag was a heavy downpour first thing in the morning that brought things to a standstill. Once the weather broke, the final runs were made in much improved conditions. The cars were broken into two classes based on tire types, with race compounds separated from street rubber. Although Allen's Viking/Mazda and the two Porsche Spyder reps were expected to dominate in the slick conditions, a combination of a drying surface and navigational errors put the snakes back into the hunt.

The top time in the Race Compound class—and the fastest time of day—was taken by Ben Sigel with his Factory Five Racing (FFR) Cobra replica. Right on his heels were Gary Cheney and Wayne Presley in similar mounts, and Bruno Angers in his beautifully hand-constructed snake. In the Street Tires class Allison Hine nailed all the guys to the wall with her just-completed FFR snake, followed by Frederick Blackall, Allison's brother Nate Hine, and Dale Ryba (also FFR mounted). The best non-FFR was Fifth-Place Bill Rousseau in his ERA.

A car show was planned for the day, but the inclement weather prevented it from taking place. However, a "dyno truck" (portable chassis dyno) was there for everyone who wanted to know just how much power they had.

After the autocross wrapped up, it was time to rally! Allen and LeDoux had conspired to lay out a challenging gimmick rally (thankfully, no math) through the spectacular woods and along a scenic lake. Contestants were asked questions to be answered along the route, and then they played a hand of poker with cards awarded based on their results. Four teams had perfect scores, but after the tiebreaker, Jack and Sandy Rosen were declared the winners.



Cruise night at Tilt'n Diner

The trail ended at the Tilt'n Diner, a '50s-style restaurant that regularly hosts a cruise night on Monday evenings. The kit cars were right at home among an impressive turnout of vintage Corvettes, hot rods, Vipers, musclecars, and various species of Tailfinus Americanus. A few kit cars also showed up that were not entered in the track event, including a just-completed Beck Lister and an attractive Ferrari Daytona restyle on a Triumph TR-7. There's nothing quite like the combination of tasty hamburgers, milkshakes, hot cars, and rock-and-roll music to get an event off on the right foot.



Paul Corazzo's ERA Grand Sport



A Beck Lister made the cruise scene but was not ready for the track events—yet!

(continued)



Tracy Hertz's Superformance 427 Cobra: Like FedEx, it gets there overnight.

If you want to send packages somewhere fast, FedEx is one priority shipper that comes to mind. Take it from us. If you want to get anywhere quick, Tracy Nolan's Superformance 427 Cobra replica is the delivery service we'd opt for. Quick delivery—whether for packages or people—is something he knows firsthand.

After graduating from high school Tracy was one of the first hires at a little startup company with an ambitious goal of providing efficient, overnight package delivery. That company was Federal Express. Tracy grew with FedEx, eventually becoming a vice president. He recently took an early retirement which, along with relocating to Los Angeles—rekindled a long-unrealized dream to own a hot car.

After a chance encounter with a Hertz GT350 "Rent-A-Racer" Mustang during his high school years, Tracy knew anything less than a

Superformance wouldn't provide the kind of satisfaction necessary to match that experience. So he began his automotive odyssey with a '69 Mach 1 Mustang, trying to reconnect with the feeling the GT350 had given him. That first 'Stang led to a stint in a '70 Boss 302 followed by a '70 CJ429 Torino. But Tracy discovered that such cars paled in comparison to his earlier Hertz musclecar experience and that probably att.e else would satisfy him. Well, call him snakebitten, though that term is usually reserved for those of us who become enamored with Cobras—or those of us who get burned by a Cobra's sidepipes, though that tends to happen only once—and for which there is no comparison short of stupid, blind love.

Now retired and living in the land of sunshine and near the nest of the original Shelby snake operation, Tracy's research naturally led him to cars of the Cobra persuasion. He

tried to find an antivenom by responding to an ad for an original Cobra for sale at House of Cobras. The car was a 289, and while not expensive by Cobra standards, one ride and Tracy immediately knew he needed more power. HOC also had a used Superformance replica on hand. After a close look, the car tweaked Tracy's go-fast bone, but it wasn't the color he had in mind. His search was narrowing.

Two months later Tracy met the good folks at Hillbank Motor, and there on their showroom floor was a bright yellow Superformance 427 clone. It was love at first sight. The nicely built Superformance cars are produced in South Africa and arrive in the U.S. less engine and transmission but are completely painted and almost ready to hit the road.

Superformance cars are sold through regional dealerships—such as Hillbank—that install engines and



Express Delivery

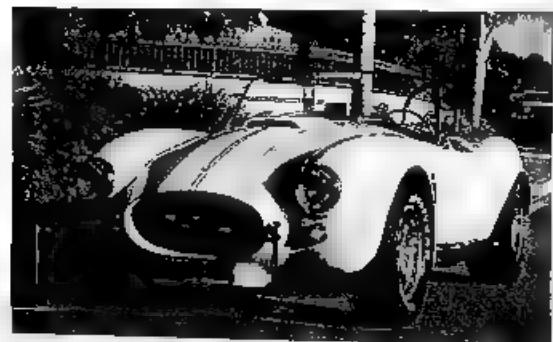


handled by an SVO high-volume oil pump set deep in a Canton 8-quart oil pan. The pan is fitted with a Canton Windage tray that knocks off excess oil, while a Canton remote oil-filter system keeps the lubricant clean.

That much hard-core hardware

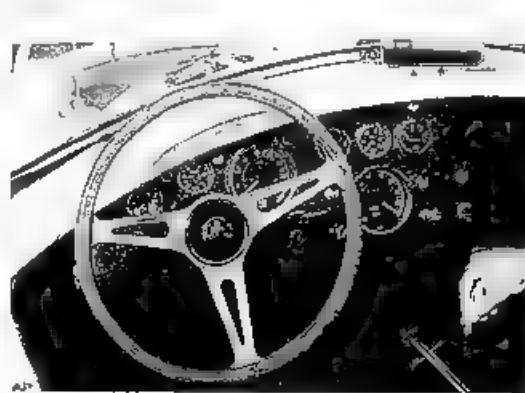
transmissions according to an owner's power requirements. This yellow turnkey snake was fitted with a crate Ford 460ci big-block engine, but Tracy—like most American males—felt the need for more power. Enter Dean Woodruff and Woodruff's Engines. Tracy went right to the back of Dean's book of horsepower and chose something he thought would satisfy his performance requirements and move him closer to reliving his experience with the Hertz GT350 Mustang.

Beginning with a 460 Cobra Jet block bored 0.030 over, then line-honed and decked for even compres-



sion across all cylinders, Dean installed a balanced, nodular iron crank, bolting on A514 polished and shotpeened rods to connect to the Ross forged pistons. To give the block lots of air, Dean added SVO Cobra Jet aluminum heads, stainless steel valves, and a Comp Roller Cam pushing Manley chrome-moly pushrods through 1.73 roller rockers to get the valves opening quickly. Holding all this together are ARP main and rod bolts. Oiling is

needed some serious fuel management, so a Blue Thunder 2X4 intake manifold and a pair of synchronized Holley 800-cfm carbs were chosen for the intake. Next came the fire by way of an MSD 6AL ignition and an MSD Blaster coil and billet distributor connected with Taylor 8mm wires. Dyno ratings now reach 600 hp. With that much power on tap, a special-delivery package



in less than a year even though his Cobra replica is one of four cars he drives regularly.

The sound of this car's engine rattles your teeth, and the power makes it take off like a rocket with double boosters. Even so, Tracy installed a great stereo sound system for those relaxing drives along the California coast.

This car runs great and makes for a great driver, but does it live up to Tracy's high-school memories? Well, considering that he and Dean can't leave well enough alone and are considering fuel injection—or maybe a supercharger—it's getting there.

KC

protected by a Lakewood scatter-shield, handles the power delivery to a specially prepared Auburn Super



SOURCES

Hillbank Motor Corp.
Dept. KC
375 Bristol St., Ste. 30
Costa Mesa, CA 92626
714/918-3242

Woodruff's Engine Specialist
Dept. KC
810 N. Lemon St.
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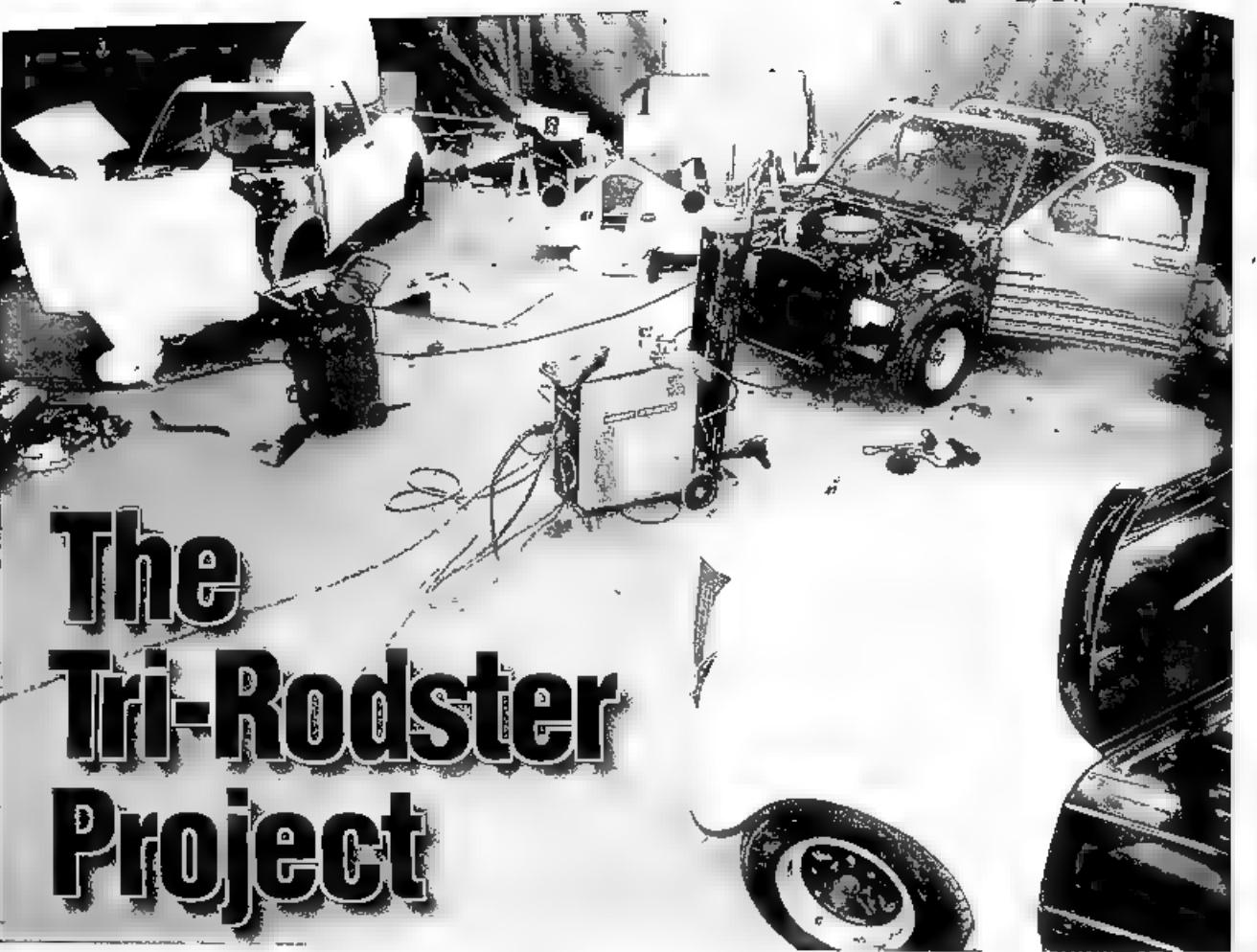
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The Tri-Rodster Project

Welcome to Ray's Chop Shop, with our three Rodster project cars in various stages.

Alternately referred to as the chop shop, the Rodster production line, or an Amish car raising, it took a village to build three cars in one week

text by Jim Youngs

photos by Kaci Cotton, Mark Wiley, Kent Wiley, Kerri Wiley, Carolyn Youngs, Jim Youngs

It all began quite innocently enough, as many car-project ideas germinate around here. Bench-racing sessions typically generate lots of "why couldn't we" discussions, and a few of them eventually lead to neat projects and great stories. Few of these ideas in my experience, however, are as ambitious and span as long a time period as the cool buildup project I'm about to outline here.

Though I've been involved with hot rods since high school, I credit my buddy Mark Wiley with getting me really involved. About the time I started freelance writing for *Kit Car*, Mark dragged me along to the NSRA Rocky Mountain Nationals in Pueblo, Colorado, in the back of his well-travelled '39 Dodge rod. Mark, like most rodders, is always discussing future projects and is never at a loss for considering that next cool car, much to the chagrin of his tolerant spouse.

Mark joined Henry Caroselli (creator of the S-10 Blazer-based Rodster, and me for part of the Hot Rod Power Tour in 1997. Of course, the topic of conversation invariably got around to future projects. After a couple days hanging with Henry and his long-haul Rodster,

Mark was hooked, particularly when he learned the Rodster kit would also easily fit a Typhoon donor. The wheels were already in motion, and Mark quickly became a Rodster prophet, spreading the word to all who would listen. He even bought a Typhoon ostensibly on which to build a hot Rodster, but ultimately decided against cutting it up. His desire to build a Rodster didn't wane, however. After more than a year of thinking about it, he called me out of the blue one day and asked what I thought about him and a bunch of his apostles building several Rodsters all at the same time. I agreed it would make a good story, and away Mark went with my encouragement.

Considerably more time passed, and Mark continued to talk about the multi-Rodster buildup, but time, family, and financial commitments kept the project in the talking stage. Last summer, Mark called again and asked what I thought about a two-car build. He had apparently convinced two of his business associates to buy into the idea, one of whom dropped out unexpectedly. I recall my comment to be, "Yeah, that would still be a cool story, but three cars might just make it a cover story."

or something like that. In the meantime, Mark and son Kent found an S-10 donor in Kansas, towed it to Texas, and ordered their Rodster kit from Henry. Likewise, Ray Yauk, an associate of Mark's, ordered his Deluxe Rodster kit and found a nice GMC S-15 Jimmy in his hometown of Buffalo, Oklahoma. They would start work toward finding someone to play third string. Mark exhausted his contacts and approached me once again with a new idea he had cooked up with the Rodsterfather. The three of us would chip in parts and pieces of the third car, do the story, sell that car at the end of the project, and recoup our individual investments.

Having a considerable investment in a bunch of my own project cars, I was pondering this latest idea when my wife, Carolyn, asked at dinner one evening out, "How's Mark's Rodster project coming along?" I explained where the project stood and Mark's latest idea. She then began to ask some detailed questions—the answers to which would provide much more information about kit cars than she usually cares to know. "How much would it cost to build this third Rodster?" "How long would it take?" "Would Henry be there to help?" "How hard is it to put the kit together?" and on and on.

I only had one question of her: "Why do you want to know all that?" Her short answer centered on wanting to figure out what this attraction between men and custom cars was all about. She also said she wanted to learn more about my passion for cars, and then confessed that she had loved the Rodster ever since I brought one of Henry's demonstrators home for a weekend of cruising. She had several other compelling reasons as well, but I must have missed some of them as I was drying my watery eyes (surely caused by the smoky restaurant atmosphere).

Now the story was taking on an entirely new personality and much wider appeal. Carolyn committed to building the third car, as well as volunteering it to be the official *Kit Car* ride for the 2001 Power Tour, on which she would join the Long Haul Gang from Detroit, Michigan, to San Bernardino, California.

We ordered the kit and began a Mountain states search for a two-wheel-drive S-10 donor on which to build a Rodster Express sedan delivery model. Guess what—there's not much call for 2WD trucks on this side of the Rockies, so we made a special trip to California—donor-car

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The Tri-Rodster Project

mecca—where we found a one-owner beauty that had been well cared for.

The plan was for three build teams to convene in Buffalo, Oklahoma, in late January 2001 and spend a week transforming three donors into hot rods—two roadster versions and a sedan delivery—minus paint, of course. Buffalo was chosen because Ray's business, Dry Fab, is housed in an old Chevy dealership that just happened to have plenty of empty, heated space in which we could all work. All three kits were delivered there, and the Dry Fab crew collected all the hardware, special tools, paint, and miscellaneous goods needed to complete all three Rodsters.

Now, Buffalo is not what you'd call a big town, especially considering the Greyhound bus doesn't even stop there anymore and the stoplight was turned off some time ago. It's quite a friendly town up there in the panhandle, however, and word of our project got around quickly. Ray's shop became quite an attraction for local visitors. It was alternately described as everything from a chop shop, to the Rodster product.on line, to an Amish car raising. We even made the newspaper and were graciously welcomed at restaurants in two towns and a motel in Woodward, Oklahoma, as we contributed generously to the economy. We nearly cleaned out the True Value Hardware store of rattle cans and drill bits.

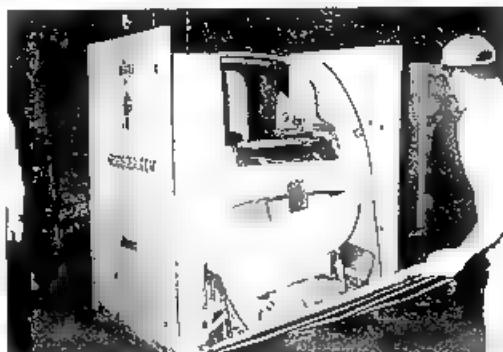
Dry Fab is a metal fabrication business specializing in oil and mining pipelines. As such, it's staffed with talented metal fabricators, welders, and craftsmen and is loaded with some of the coolest big tools you can imagine. It also houses a well-stocked hardware section, all of which contributed greatly to our project, particularly the skilled guys who went well beyond helping. Henry designed the Rodster kit to be able to be assembled at home with minimal tools, but items such as plasma cutters, MIG welders, hydraulic shears, metal brakes, pneumatic nubblers, air riveters—and the talented guys who use them every day—were most welcome.

We roamed among the three donor cars to help as we could. After one team completed a task, we went on to help the other two accomplish the same procedure. In a kind of training exercise for Mark's Wile Engineering employees, the Tri-Rodster Project—as he called it—was set up on a project management Gantt flowchart and each step on the three cars was timed and logged. If you're interested in following along on the whole project, log onto www.trirodster.com and enjoy.

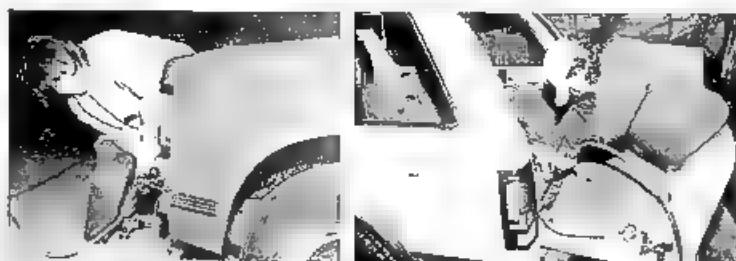
Ray's Dry Fab team consisted of son-in-law Paul, son Donny, and lots of frequent



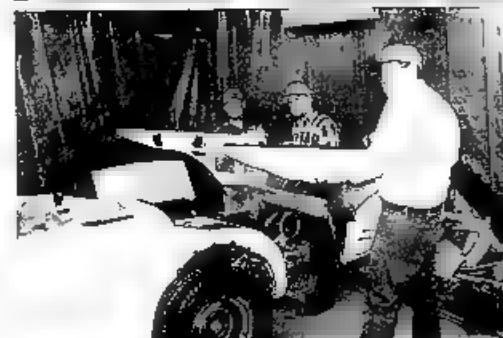
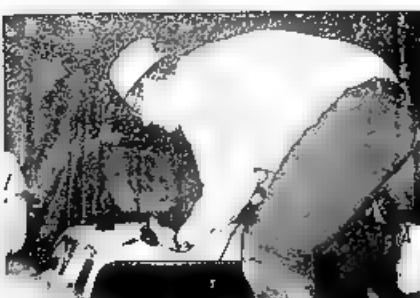
The three owners and their donors. From left to right: Ray Yauk, Mark Wiley, and Carolyn Youngs.



Let the unpacking begin. Thanks to Henry's meticulous crating of the kits, we didn't have any shipping damage or missing components.



Most of us got our donors mechanically in shape and lowered before arriving at the chop shop. The sedan delivery's battery was also relocated to the rear before arriving. Before any fiberglass parts were added, the S-10s' front ends had to be dismantled. Carolyn and Kerri are shown here learning the intricacies of a pneumatic ratchet in removing the grille and tailgate.



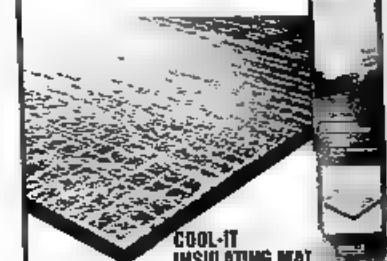
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The Tri-Rodster Project

visitors. Mark's team was mostly family members, including kids Kent, Kerri, Kaci, and Kaci's new husband, Adam Cotton. The Youngs' team was Carolyn and myself. Oh yeah, we also enlisted Mike the mechanic, who just stopped by to visit, bend a few brake lines, and consult. And of course, the talented Dry Fab crew helped us all.

Also thankfully floating around for the first four days was Henry Caroselli, a decidedly major benefit to building these Rodsters, since we didn't have to read the build manual as thoroughly. In addition, he popped for a couple of meals and drove the 35 miles to our hotel through one particularly nasty ice storm at night. What we were thinking letting a Southern Californian drive in that kind of weather was testament to the exhaustion after a couple of particularly long days of marathon kit car building.

I'll let the photos do most of the talking here as to the progress made building three Rodsters in a week. But, I will say that the kits go together as described in the manual and are straightforward if you follow the instructions. Henry has done tremendous research and development in designing the Rodster kits, and it shows well in the fit and finish of the components. Even where we thought we could do a better job, such as locating the new radiator further aft than called for, we were reminded that Henry has a reason for virtually every procedure and every component placement. But even Henry can be shown a thing or two, and the Dry Fab guys in particular discovered a few new tricks that Henry hadn't considered.

So, how did we do? Well, Carolyn's sedan delivery rebody was easily accomplished in the course of the week. In fact, she and I jumped in it on Friday afternoon and drove it the eight-or-so hours back home to the Denver suburbs. It has subsequently been driven to Tempe, Arizona, where it is—at this writing—undergoing the complete body shaving and flame paint treatment in the capable hands of Gordon Levy and crew at Levy Racing.

As we left, Ray's Rodster was within a day of receiving the final touches before it went to the paint shop there in Buffalo. And Mark's V-8 machine? Well, let's just say he had to spend a couple days away from the project during the week, so it required a few more days—about a month later—to get it ready for paint.

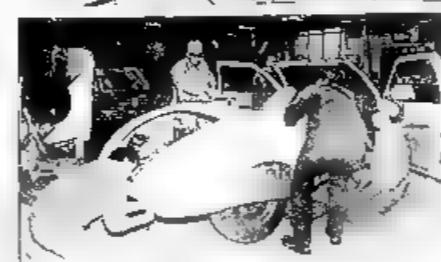
Next stop, the Power Tour kickoff in Detroit, where the three finished Rodsters will gather with a couple thousand other hot cars in preparation for a 2,500-mile jaunt to the West Coast. So, stay tuned for even more of the Tri-Rodster story and to see the completely finished cars.



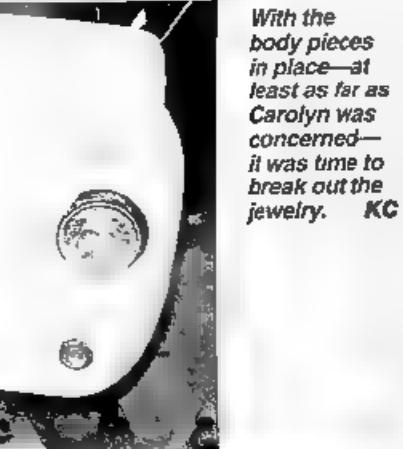
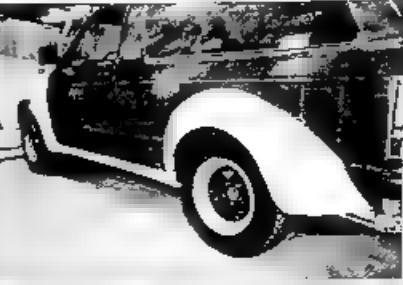
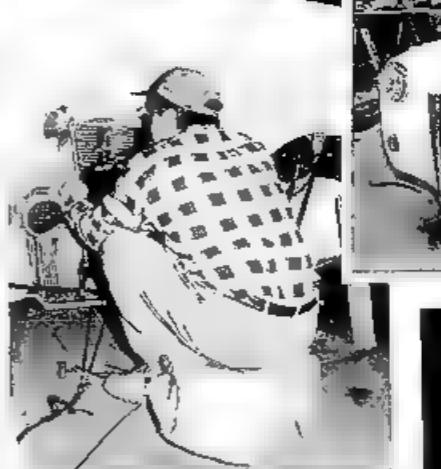
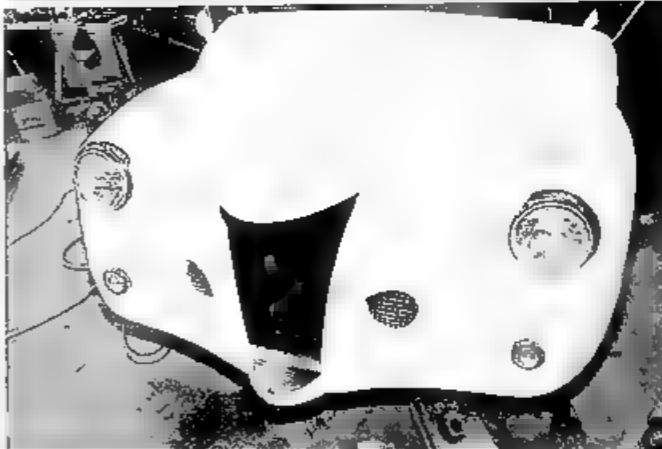
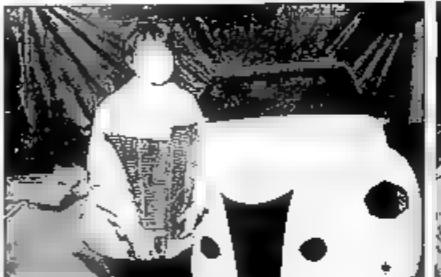
Before any kit pieces are added, the front frame horns and body mounts need to be trimmed and ground smooth. Paul was our resident torchman and welder, while Adam became well-acquainted with a grinding disc.



With the donor prepped, it's time to ready the body components for trial fit and installation. A little fiberglass trimming might be necessary to ensure even gaps and a good fit.



Once the body is preflited and trimmed, it's time to break out the Vette glue to get some of these fiberglass components permanently in place. Depending on atmospheric conditions, the two-part adhesive may require lots of hands and quick work. We mixed a test batch and timed the cure rate, then had our timer call out the minutes as we glued the parts in place. The photos above show the progression as Henry and Donny get ready to apply glue to the rear clip, Mark applies glue to the roughed-up donor body, Henry and Carolyn work on the quarter-panel, and all hands chip in to place the clip into proper position. The piece is then screwed and clamped and allowed to dry—a happy moment for Henry.



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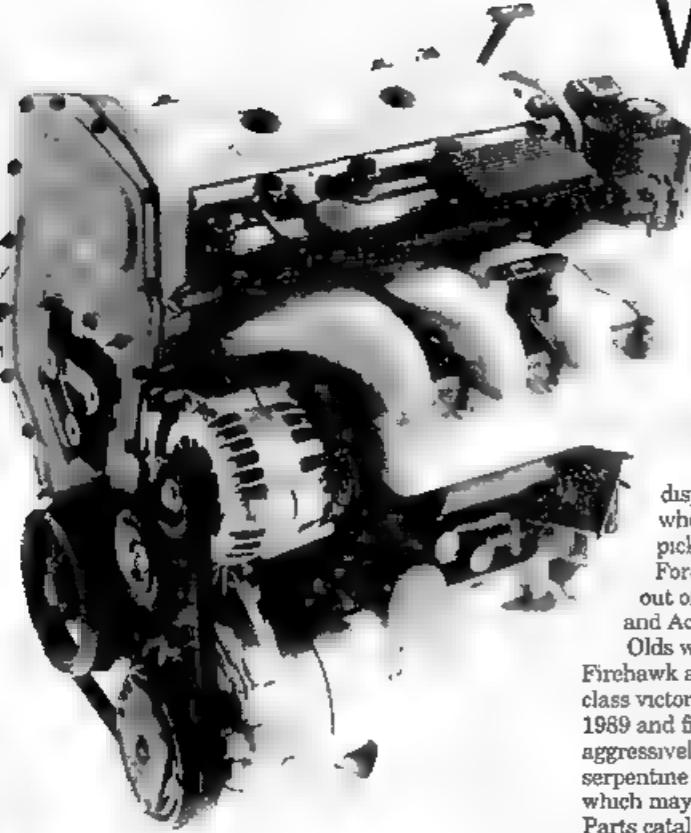
With the body pieces in place—at least as far as Carolyn was concerned—it was time to break out the jewelry. KC

QUAD MODS

Mixing and matching the best pieces from GM's DOHC wonder to improve a popular Fiero engine swap

text by Jeff Koch, Hot Rod Magazine

photos by Jeff Koch and Oldsmobile Historical Center



When it was introduced in the waning days of the '80s, the Quad 4 represented a massive step forward for GM Oldsmobile—along with Batten Engineering and Feuling Engineering—developed the 2.3-liter iron-block, four-valve DOHC aluminum-head powerhouse for the smaller end of its rapidly expanding FWD lineup. Concurrently, a 750hp twin-turbo 2.0L version made big news in the longtail Aerotech, a full-bodied aerodynamic wonder on a March Indycar chassis that A.J. Foyt piloted to 266-plus mph and the American closed-course speed record at Fort Stockton, Texas. Production Quad 4s debuted in the '88 model year. In a day when Oldsmobile's 307ci V-8 made 180 hp in H.O. trim, a Four with half the displacement and the same horsepower at the flywheel propped everyone's eyes open with toothpicks. (Base Quad 4s produced 30 hp less.) Why, Ford needed a turbo to get the same power output out of its 2.3L Four. Later, W41 package Olds Calais and Achievas made 190 hp.

Olds went racing with the Quad 4, primarily in IMSA Firehawk and SCCA Showroom Stock, racking up multiple class victories, manufacturers' class championships in 1989 and from 1991 to 1993, and promoted its victories aggressively. The IMSA-prepped cars featured non-A/C serpentine belts and other aftermarket tricks, some of which may still be available through the GM Performance Parts catalog and may be adaptable to newer cars; thanks to optimization and a lack of emissions equipment, these engines made roughly 220-230 hp.

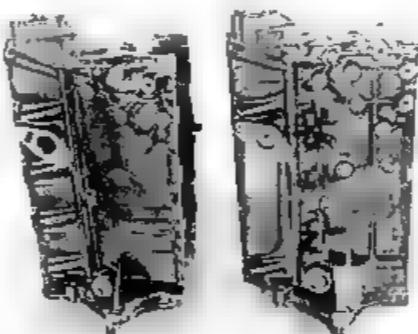
Though a success in terms of units built and race victories (and no one ever complained about the power), the 2.3L Quad 4 was bashed by the motoring press for its rough and tumble attitude. As a result, virtually every change made to the Quad 4 has been in the name of improved emissions and greater noise, vibration, and harshness (NVH) suppression. A '95 redesign decreased bore and increased stroke, bumping displacement to 2.4L. Balance shafts smoothed things out, and it had improved lubrication and cooling, as well as power output that has stayed at 150 hp despite near yearly tweaks. The Quad 4 name was dropped when the 2.4L was introduced, and it is now referred to as the 2.4L Twin Cam, but for this story we will refer to all engines of this type as Quad 4 and use displacement to differentiate between the two. All inspection was done at Katch Engineering, which worked with Quad 4s in their racing heyday.

Since the Quad 4 has been around for a dozen years, there should be an ample supply in local boneyards. We got together with GM Racing's Mark McPhail—a strong proponent of front-drive performance—to tear a 2.3L and a 2.4L apart, measured the changes, saw what improvements the factory made over time, and figured out what pieces from one engine could work on another. McPhail notes that there were many running changes throughout the engine's life, and that just because your car is set up a certain way it doesn't mean that the parts car you're pirating from in the yard will have exactly the same ones. "Assume nothing," he warns.

You can mix and match any number of components (with varying degrees of difficulty), but McPhail feels that the strongest Quad 4 setup would mate a 2.3L head to a 2.4 block, thereby combining the strongest block and the best-flowing head and cams; he would also ditch the

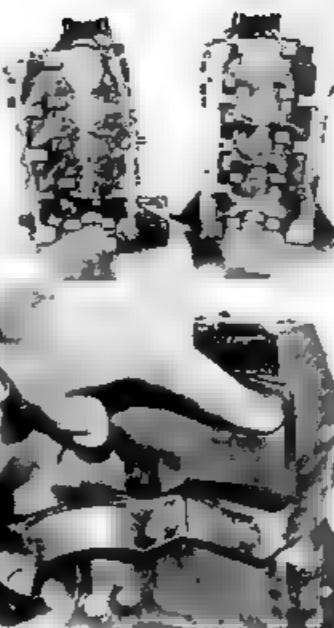
balance shafts. He warns that the '95 engine was a "transitional" engine—a 2.3L with balance shafts—and to avoid it for serious performance upgrades. Also, a single-cam version of the Quad 4 was available in some models for only a couple of years and should be avoided.

Since it's not always possible to swap a newer block into an older car (or vice versa, for physical or emissions reasons), we've tried to pick out each engine's strong points so you can choose modifications for your own Quad 4-powered monster. All we need now is an aftermarket to step up and cater to the millions of Quad 4s out there. The GM Performance Parts catalog offers some pieces, but sadly it's only a fraction of what's available for popular V-8 applications. Check your GM Performance Parts dealer for availability. Other long-discontinued pieces were once available through the Rocket-parts catalog (we saw one dated 1993); these pieces exist somewhere, but you may have to do some digging.



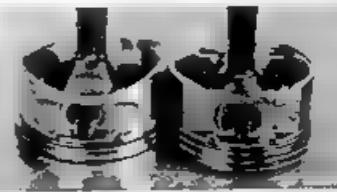
BLOCKS

There are two basic Quad 4 cylinder cases: the '88-'94 2.3L block (left) and the '95-up 2.4L block (right). The LGO engine is the hot 2.3L setup, common to Beretta GTUs and Olds Calais Quad 442s (the eighth digit in the VIN will be an A). The LGO motor will have most of the high-performance factory components—such as hot cams, a smaller crank pulley, and 10:1 pistons—needed to make your Four roar. Block IDs face the firewall in both cases, should you find one still in a car. (Note to trivia buffs: The 2.3L engine actually measures in at 2.245 liters according to the '93 Olds shop manual, which technically makes it a 2.2L. Other sources—notably press literature—claim it's at 2.260. We believe the shop manual.) The LD9 2.4L features numerous oiling, cooling, and structural improvements, not all of which can be retrofit or reverse-engineered to the 2.3L. (Our photo-specimen 2.3L block is a standard-issue '93 9.5:1 LD2.) A rough-finished early block is still listed in the GM Performance Parts catalog. It features thicker cylinder walls, relocated oil passages to accommodate a longer-stroke crank, thicker main bearing bulkheads, and more. An engine machining plate is also available through the GMPP catalog; honing the block with a deckplate is recommended.

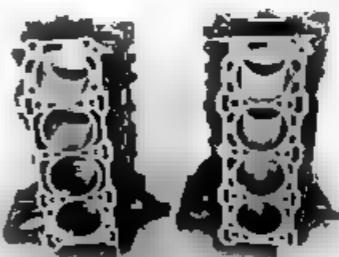


PISTONS

All Quad 4s maintain a zero deck height—meaning the top of the piston will travel no farther than the surface of the block. The common 2.3L runs 9.5:1 compression with a slightly dished piston, while the LGO provides 10:1 with flat-top slugs. The 2.3L pistons, as well as semi-finished 2.3L rods, are available through the GM Performance Parts catalog. The 2.4L also runs a flat-top piston, but thanks to larger combustion chamber volume, it still measures out at 9.5:1 compression. The 2.4L slugs have a $\frac{1}{8}$ -inch top and second ring, while 2.3Ls have thicker rings. Thinner rings present less friction and greater stability at high rpms. A forged 0.010-over 2.3L piston is available through the GMPP catalog.



The 2.4L block (top right) has taller main webbing and is clearly beefier (a bare 2.4L block weighs 110 pounds versus 93 pounds for a 2.3L). The newer block is relieved for the longer-stroke rods and crank, and it also has deeper head bolt passages. The finger points to where the reliefs are visible. Both blocks are windowed. Note the oil pickup tube on the older block; the 2.4L's oiling system is somewhat more sophisticated. The engine mounting points also changed in 1996, so it's not so easy to bolt a newer block into an older chassis, or vice versa.

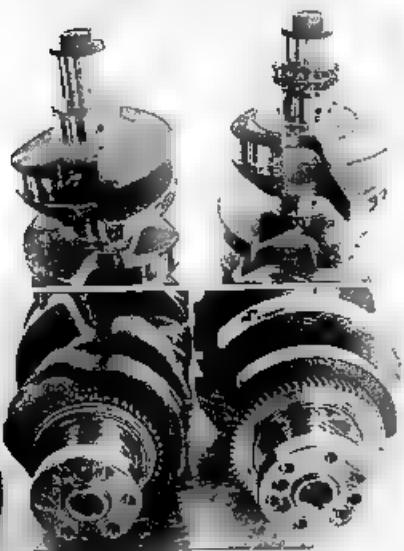


The 2.4L (right) has a smaller bore (90mm/3.54) than the 2.3L (92mm/3.62), which means you have more meat to hog out if you decide to overbore. If you plan this modification, have the block sonic-checked. Minimum wall thickness in racing applications is 0.160 (a little thicker for the street), so if your block tests to a 0.230 on the thrust side, you can go to as big as 0.140 on the overbore. Note also the improved coolant passages on the outside cylinders and the more restricted cooling veins on the inner two.



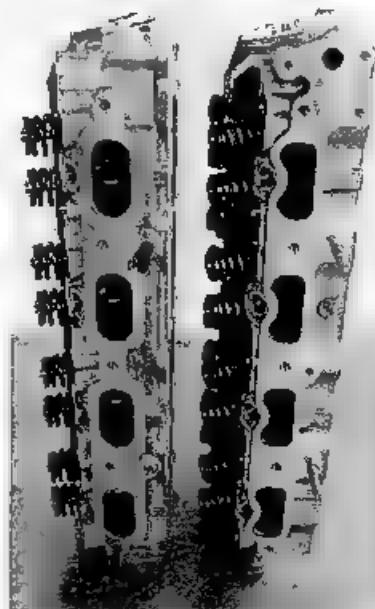
The 2.4L's rods are clearly larger, as are the connecting rod oiling holes.

QUAD MODS



CRANK

The 2.3L crank (left) weighs 47 pounds; the 2.4L crank (right) weighs an even 43, which means that not only is the 2.4L crank lighter, but it also strokes the old block out to an even 2.5L. It is physically possible to put a 2.4L crank in a 2.3L block, but you will have to turn down the mains to accommodate the 2.3L's smaller main saddles, and you'll have to widen the rod journals. The 2.3 uses 2.06-inch main journals, while the 2.4L's expand to 2.36 inches. The 2.3L crank has an 85mm stroke, while the 2.4L crank offers a 90mm stroke. All the cranks in these engines are cast nodular iron and share common rod journal diameters. (Bearings are available through the GMPP catalog in 0.0005, 0.001, and 0.010 undersizes.) The crank sensor has been relocated twice: first in 1989 (making the '88 crank a one-year oddball) and again in 1995. This means that the reference angle on the crank itself has also changed, so you'll need to play with engine calibrations to change the spark reference angle, or else bias your spark advance. The 2.4L crank trigger wheel, incidentally, is wider but smaller in diameter. WOT spark advance above 4,000 rpm should be set at 22-24 degrees. All Quad 4 cranks are internally balanced; dampeners double as the crank pulleys and are interchangeable. The hot tip here is to go with an LGO damper/pulley on all Quad 4s; it's smaller than the standard-issue piece and will reduce accessory drive speed, freeing up horsepower. Quad 4 cranks all have undercut rolled fillets. Never undercut a Quad 4 crank, as this will void the compressive stress in the fillets and weaken the assembly. Back in the day, the Rocketparts catalog offered standard semi-finished, heavy-duty forged and lightweight forged cranks.

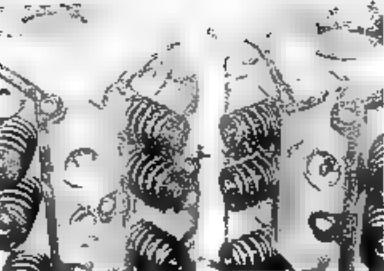


The 2.3L head features a wide oval intake port. The 2.4L intake port adopts more of a "bandit's mask" shape.

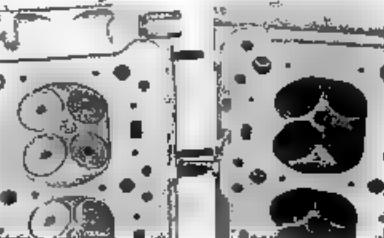


HEAD

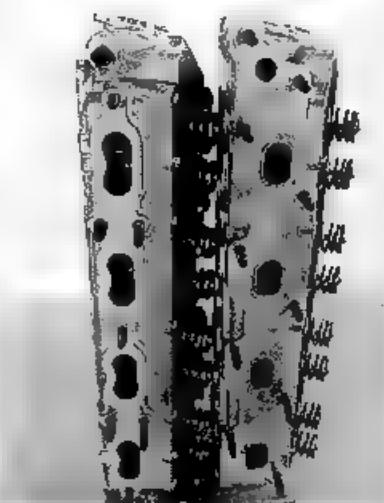
Cylinder heads are interchangeable, and without a doubt, the '89-'92 Quad 4 has the best one of the bunch, even though the 2.4L's valve-train mass shrank



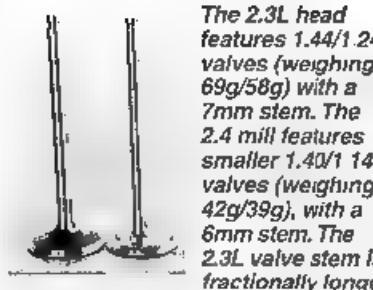
McPhail recommends either out-of-production Rocketparts or LGO valvesprings. From the factory, the 2.3L's 84-pound valve springs (60-pound on the 2.4L) are "beehived"—slightly cone-shaped to prevent resonance and increase dynamic range. The good news is the old springs fit the new head, though it may be a bit too stout for the lighter valves and retainers.



The 2.3 incorporated a distinctive point between the intake valves called a "cathedral." The 2.4L combustion chamber (right) features a flattened cathedral and has additional contouring to induce swirl.

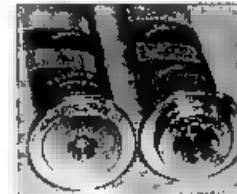


Bigger is not always better. The 2.3L's exhaust ports are massive compared to the 2.4L head's tiny ovals, but they still aren't as big as those in the '88 Quad 4 head.



The 2.3L head features 1.44/1.24 valves (weighing 69g/58g) with a 7mm stem. The 2.4L features smaller 1.40/1.14 valves (weighing 42g/39g), with a 6mm stem. The 2.3L valve stem is fractionally longer (4.32 inches versus 4.25) and is tulipped—mostly for mass, though it also helps trim the compression ratio. The weight of the valve lash caps was reduced by half as time went on: 16 grams in the 2.3L and just 8 grams in the 2.4L.

All 2.4L engines have much longer head bolts that help to reduce block deck distortion from the torquing procedure. The 2.3L head bolts are stubby by comparison. Also, the most recent style head gasket is the best—it overcomes some concerns regarding thermal cycling that earlier head gaskets had. The 2.3L and 2.4L gaskets will not swap, so get the latest-construction head gasket for your 2.3L. This gasket measures 1.2 mm compressed.



CAMS

The curse of a small DOHC engine is that it gives up torque for high-end horsepower, but the right cam timing can dial some of this out. You can degree each cam separately, which makes for theoretically infinite retard/advance adjustments. All factory Quad 4 cams are hydraulic flat-tappet: Those in a 2.4L are 0.345/0.345 lift (advertised), basic 2.3L Quad 4s had 0.375/0.375 lift cams, and the sticks in the '89-'94 LGO (also known as W41 cams) have 0.410/0.410 lift. The Rocketparts catalog offered cam sprockets to advance and retard cams; Olds recommended 2 degrees advance on the intake cam and 2 degrees retard on the exhaust for maximum results.

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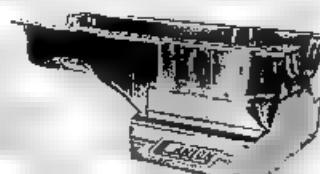


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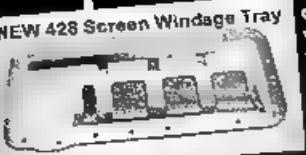
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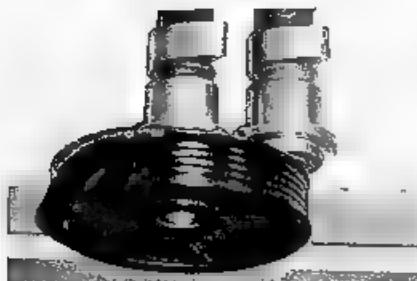


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JULY 2001 KIT CAR 33

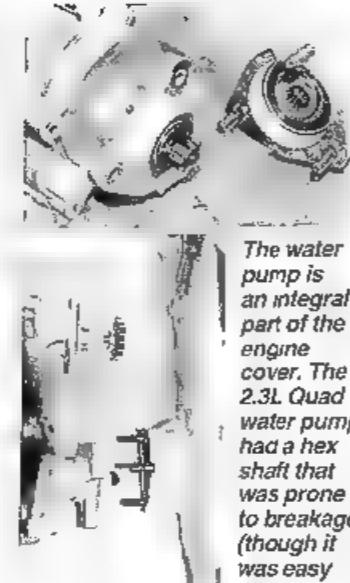
QUAD MODS



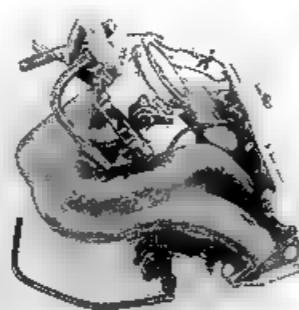
Alas, LGO cams are far from bolt-ins on '95-up engines. The problem lies on the intake side. Older cams come with a power steering pulley, while the new cam has a hex-shaped notch where the 2.4L car's power steering pump attaches. The cam blanks changed in 1995, when GM switched from belt-driven to direct-drive power steering—one more factor making the '95 2.3L a transitional engine. If you can live without power steering, the simple solution would be to hack the pulley off and go with a manual setup, though it's not advisable with a powerful street-driven FWD car. You can adapt the old head to the new power steering unit, however. Use the 2.3L head, cam, and cam carriers, use the larger 2.4L lifters, and machine the end of cam for the late-model hex-drive power steering pump. It's imperative to keep the cams and cam carriers constant between 2.3L and 2.4L cams, as the carriers' seal diameters differ as well.



TIMING COVER/WATER PUMP
The timing chain on 2.3L Quads was a double-roller unit and worked via a spring tensioner and a one-way check valve to prevent slack (seen here). Packaging and lubrication were issues when the Cavalier/Sunfire was redesigned in 1994-'95, and GM incorporated a quieter single roller chain. In the process, it upgraded the system to eliminate the one-way check valve, replacing it with a tensioner that works off oil pressure. The good news is that the new, more reliable tensioner system is an easy swap for the old Quad—just make sure you use the new front cover and all of its guts, or the conversion won't work. Like the stock cam gear on a small-block Chevy, the hub of the roller chain is metal, but the teeth are plastic. Durability has never been a factor.

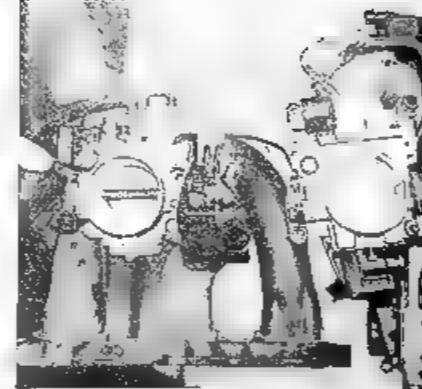


through the front of the timing cover). The '95-up style water pump system is far stronger, but you have to remove the entire timing cover to replace it.

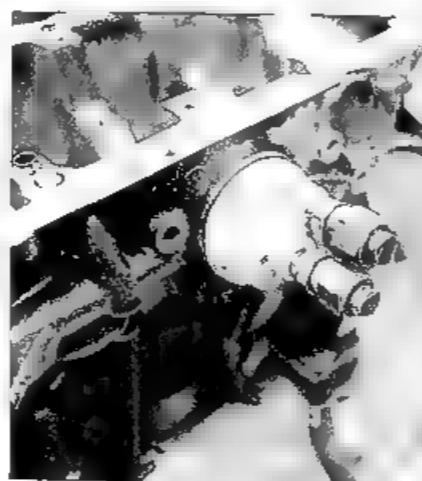


INTAKE

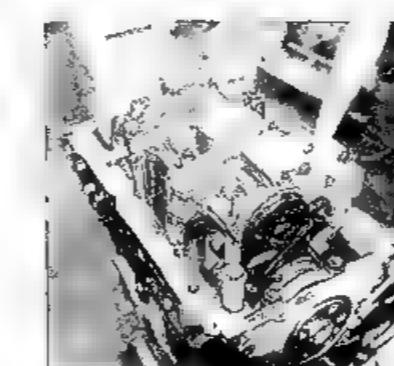
All stock intake systems upstream of the throttle body are bulky and complicated. Fabricating your own from dryer tubing should create a marked performance improvement in any Quad 4-powered car. The 2.3L intake manifold weighs 164 pounds; the plastic one on the 2.4L engine weighs but 6. Though the newer intake is a far less complicated setup, it features a different bolt pattern and there isn't enough meat to bolt a new intake onto the old head. The throttle body on the 2.4L is horizontally mounted, similar to a traditional carburetor. If you're running a 2.3L, an early cast-aluminum intake may be your best bet; it flows every bit as well as the plastic one on the 2.4L.



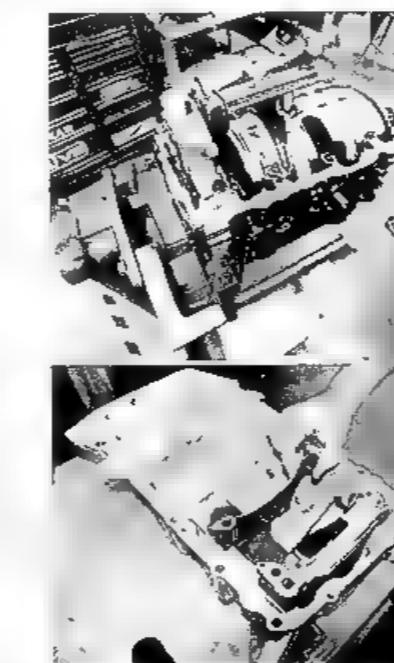
The 2.3L Quads use a 56mm throttle body held to the intake by two bolts. The 2.4L uses a 52mm version that is held by four bolts. There's enough meat on the base of the 56mm throttle body to drill two new holes and attach the old throttle body to the new plastic intake. Everything else plugs in.



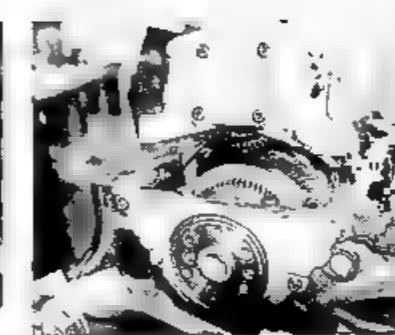
OILING/BALANCE SHAFTS
Oil pans are not interchangeable between 2.3L and 2.4L engines because the pan rail bolt pattern is not the same. The old showroom stock program for the 2.3L included an oil cooler—our sources didn't have one to check if it could be adapted to the 2.4L, but it should at least be possible. The 2.4L engine uses the same size (read: tiny) oil filter as an LS1; a Trans-Dapt 1020 adapter gives a variety of pipe-tap sizes for external AN lines. Furthermore, the new bung easily swaps to the old block, so even older 2.3L Quads can benefit from this adaptation of available aftermarket equipment. The early external oil cooler adapter is still listed through GMPP.



Balance shafts weigh nearly 21 pounds, but they smooth things out considerably. Unfortunately, they eat power. Just because 2.4s pump out 150 hp and 2.3Ls were rated at 180, however, doesn't mean that the balancers cost 30 hp. There are some adverse effects on windage in the crankcase, but the 2.4L was reengineered to boost torque at the expense of horsepower. The shafts cost approximately 15-18 hp.



The 2.3Ls came with a windage tray to help keep oil off the crank. Subsequent redesigns of the 2.4L improved oiling, and the balance shafts came aboard, thus the 2.4L engines do not have a windage tray. If you're keen on ditching the balance shafts on your 2.4L, you'll need to adapt a 2.3L oil pump; luckily, it fits the 2.4L block with a bit of drilling. You'll also need to relieve the rib in the oil pan for clearance.



The oil pump is driven by a gear at the back of the crank. The teeth on the 2.4L crank are bigger, as it must drive the balance shafts. Changing the oil pump drive is the answer.



FLYWHEEL
Base 2.3L and all 2.4L flywheels weigh within a few ounces of each other. The LGO engine has a lighter flywheel, which is recommended for performance applications, as is the LGO-specific clutch assembly.

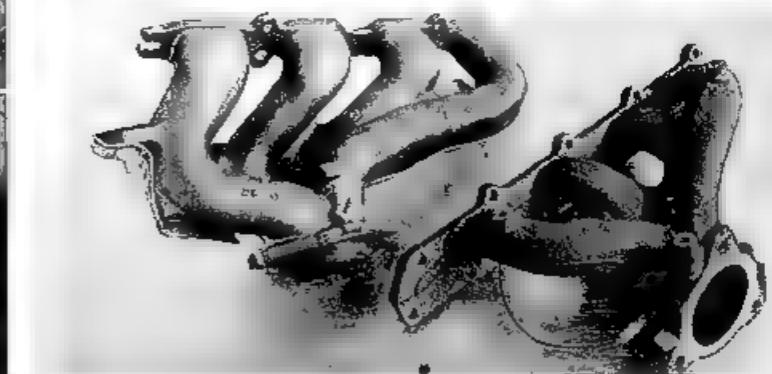


STARTER
A good retrofit and an easy bolt-on for all Quad 4s is this late-model starter, called PMGR (Permanent Magnet Gear Reduction). It weighs but 8.6 pounds, and is torquier than older stock GM starters. This one came off a later-model Quad 4. A similar unit is available on the current Pontiac Montana minivan and works for all 2.8/3.1/3.4 pushrod applications. Additionally, the 2.4L block has beefier webbing for the starter (another problem area on 2.3Ls).

SOURCES

GM Performance Parts
800/468-7387
www.spoperformanceparts.com

Katech Engineering
www.katechengines.com



EXHAUST
As the exhaust ports on the head changed, so did the corresponding exhaust manifold/headers. The 2.3L header (left) is shown next to a 2.4L exhaust manifold; both are cast iron. Is there any doubt which one will help performance? LGO manifolds have 2-inch openings, those on the '96-'98 2.4L engine shrank to just 1½ inches, and '99-and-later cars were revised with a 1½ primary-diameter header—another concession to earlier catalytic converter light-off. The manifold bolts (hardware) remained the same through 1995 and were revised for 1996, but the installation points remain constant. Once again, the bolt pattern changes between engines mean that on some body styles, some earlier large-port manifolds may not clear the transmission tunnel.

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LOTUS EXTREME

The
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text and photos by Harold Pace

When the Lotus Europa was introduced in 1966, it was considered a revolutionary design. It was the first mass-produced, midengined sports car, beating the Porsche 914 to market by three years and the Ferrari-built Dino 206 by one year. At the time, Lotus stood at the pinnacle of the racing world with two recent world championships in Formula One and a victory at the Brickyard to brag about.

The Europa was a beautiful design that was intended to be less expensive to build than the Elan that had preceded it, but it came up short in the powertrain department. In order to make it competitive pricewise in the European Common Market, it borrowed engines and transaxles from the Renault 16 sedan, which wasn't exactly hot machinery. Later, Lotus Twin Cam engines based on the Ford 1500 block upped the power ante to 113 horses, and with a weight of only 1,600 pounds it was a sprightly performer capable of giving an early Porsche 911 a run for its money. It handled like a rat with tennis shoes, and the racing version—the Lotus 47—was winning in Europe. However, all was not rosy in the Lotus camp.

The Europa was quick all right, but it was also poorly built, difficult to maintain, and spare parts were thin on the ground. Europa components were frequently sourced from European sedans that were not imported to the U.S. The Europa was a diamond in the rough, passed over by Lotus fans as a step down from the Elan that preceded it, and soon outpaced by new models from Porsche. The end came in 1975 when the Europa gave way to an array of new Lotus models—none of which were improvements from a styling or durability perspective.

But Laminar Concepts in Pennsylvania saw the

Europa's potential and refused to give up on it. As the resale value of Europas plummeted to tired Pinto levels, Laminar saw the potential to use it as the basis for an extreme sports car based on up-to-date machinery. Although the company also sells body and suspension packages for upgrading standard Lotus Europa models, its specialty is the radical Evolution Europa.

For starters, Laminar throws away virtually all the Lotus parts (a great idea). The chief virtues of the Europa were the general configuration, light weight, and clean styling, and these remain intact, if polished a bit. Buyers can begin with either the Series II Renault-powered model or the later Twin Cams. The Series I model is rare and different enough to not be recommended—save them for the collectors. Expect to pay \$600-\$5,000 for a rebuildable Europa (the Renauit versions are much cheaper), and Laminar can help locate a suitable donor. There is a stylistic difference. The Renault-powered Europas have a panel-van-type sill above the rear fender, while the Twin Cams have a notched rear quarter-panel to give more rearward visibility.

The Evolution uses a carbon fiber-reinforced tub and Kevlar front and rear clips with standard or flared fenders. Optional panels include an air dam with splitter, boxed rockers, and a rear wing. Aero headlights are

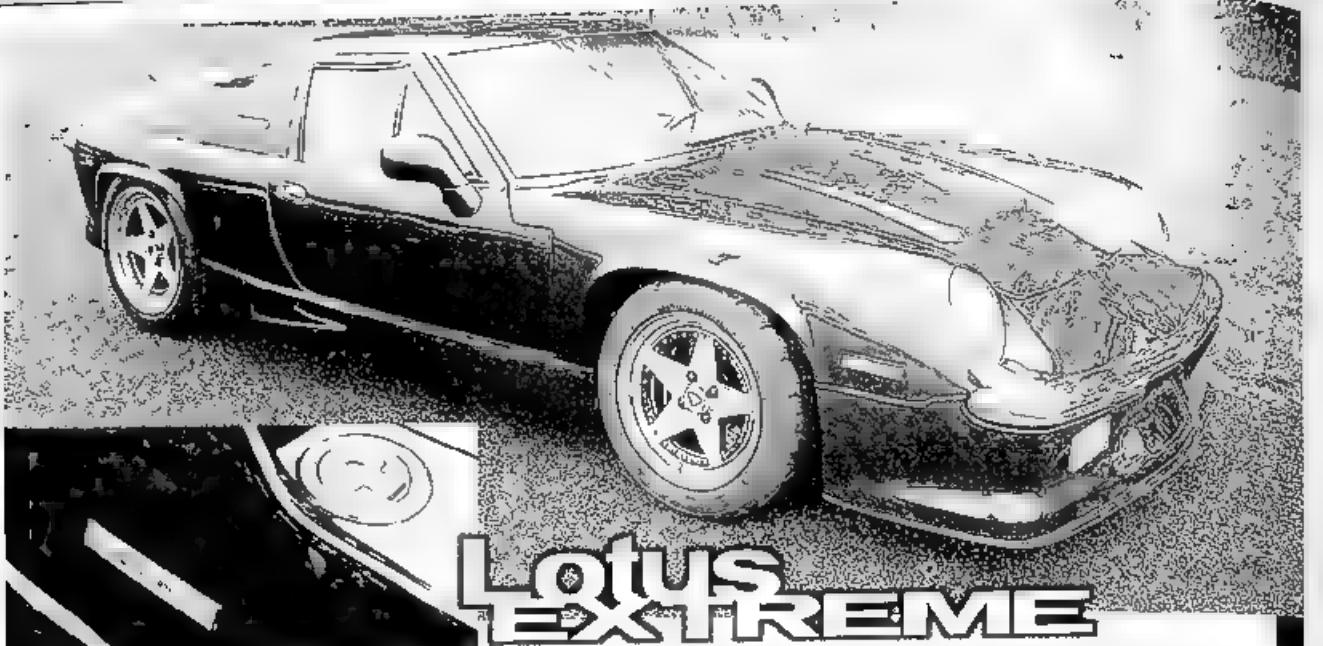
frenched into the front fenders and matching taillights are fitted into a custom rear valance. Special side-marker lights, rear grilles, and an internal intercooler duct complete the body mods (not all Evolutions have these optional panels).

The interior was also in for a change or two. Mazda parts replace fragile door locks and handles. A carbon-fiber dashboard, a console, door panels, and seats save weight and have a modern race-car look. The dash, seats, and door panels are upholstered in leather and a MOMO 12-inch steering wheel is used. Carpet is Wilton wool, and power windows and mirrors are standard. Air conditioning is optional. Normally Stock Indy Car digital instruments are used, supplemented with VDO boost gauges.

The original Lotus Europa used a fragile backbone-type frame with a mix of suspension parts. The Evolution uses an upgraded and powdercoated chassis from England that features a tubular space frame with a bonded and riveted anodized aluminum stressed skin. It's three times more rigid—and better made—than the original and features an SCCA-legal rollbar. The racing-type suspension is fabricated from tubular steel and uses aluminum hubs, adjustable antiroll bars, and quick Lotus rack-and-pinion steering. The inboard aluminum coilover units are activated by pushrods similar to those on a modern formula car, and are adjustable for damping and ride height.

The standard Evolution brakes are cross-drilled 12.19-inch vented discs up front and 11.75 inches in back. Four-piston aluminum calipers are used all around. Other brake systems are available on request. Tandem master cylinders have a cockpit-adjustable bias control, and all lines are braided stainless steel. The standard three-piece wheels are 15x9 inches wide in front and 17x11 inches in the rear, shod with Goodrich R-1s (225/60-15 front and 275/40-17 rear).





Lotus EXTREME

It would be a shame to couple all these exotic underpinnings to a 113hp mill, and the Evolution does not disappoint. The buyer's choice of Mazda 13B rotor motors are fitted, with or without turbos. Most use the third-generation twin-turbo mill generating around 350 hp. Stainless steel headers and exhaust top off the package. This powerhouse is backed by a Porsche 901 transaxle with a Quaife limited-slip differential. A variety of ratios are available. With a dry weight of just under 1,600 pounds, the Evolution Europa has the potential to be a serious road rocket—4.57 lb/hp as compared to 7.43 for a Viper GTS R.

FORMULA CAR FOR THE STREET

The midnight blue Evolution shown in our photos was built for a customer who races Formula Atlantic cars. After spending time behind the wheel of those technorockets, he wanted something similar for the street, more so than the Corvette ZR-1, Ferrari 348, and Porsche 914/6 that preceded it. A '73 Europa Twin Cam was purchased for \$3,000 and the fun began. In went the full Evolution frame-and-chassis treatment with specially valved Carrera aluminum shocks and Eibach springs. Since each Evolution is custom tailored to the owner, this car has several derivations from standard, including Porsche 993 four-piston aluminum caliper brakes up front with cross-drilled and vented 11.75-inch rotors. In back, Wilwood Dynalite calipers were used on similar rotors. The wheels are Image mags (made in the UK), 15x7 inches in front and 16x9.5 inches in the rear, shod with Yokohama A032R tires (205/50-15 front and 245/45-16 rear).

The engine is a street-ported '94 RX-7 rotary that has

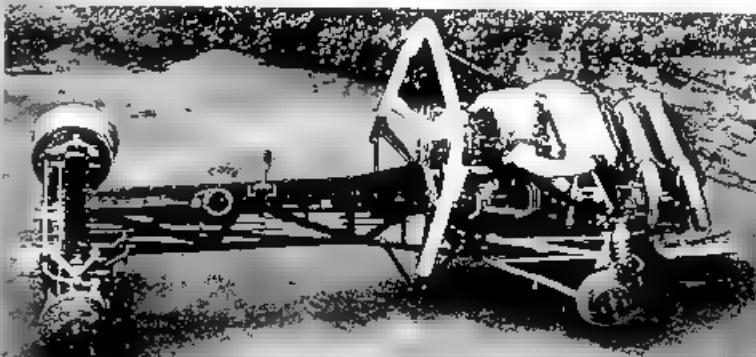
been polished and port matched with big impeller conversions for the twin turbos. The headers have been modified, Jet Hot coated, and attached to Edelbrock 3-inch stainless steel mufflers. An air inlet in the left side rocker panel feeds an RX-7 oil cooler, and the engine air inlet is in the opposite rocker (feeding through a K&N filter). To get all the parts needed, Laminar purchased an entire front clip off a wrecked 11,000-mile RX-7. This provided the engine, wiring harness, and all of the fuel system. A Kennedy Engineering clutch and adapter is used to bolt up the mighty rotor motor to a Porsche 911 transaxle converted to side shift.

The owner opted for minor body mods instead of the wilder flare treatment. The stock body was reinforced with carbon fiber, and an aero kit was fitted that works with the narrow stock bodywork. The steel bumpers were retained (and rechromed) and no rear spoiler was fitted. The headlights received the aero treatment, and lower rockers were added for the NACA ducts that go to the oil cooler and engine. The sophisticated paint is '99 BMW Orient Blue Metallic and gives the car a menacing look.

Inside, a '94 RX-7 instrument cluster was modified and installed along with VDO boost and EGT gauges. Mazda aluminum pedals are also fitted. In addition to a Vintage Air air-conditioning system, a custom stereo makes this rocket livable on road trips. White leather and carbon fiber trim out the interior. And how does it run? At its first Lotus National Meet, it took second fastest time of day in the autocross to a full-race Super 7. Pretty is as pretty does.

In addition to making the Evolution, Laminar Concepts also sells the popular Viking line of cycle-fendered sports cars that use the same Mazda engine package, but the Evolution Europa is certainly a more civilized beast—and a beauty to boot! All the parts are available separately, and turnkey cars begin at \$64,500.

KC



SOURCE

Laminar Concepts Inc.
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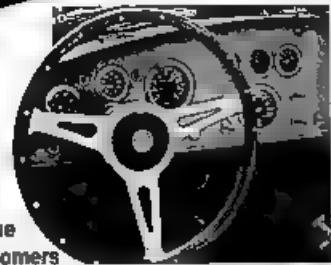
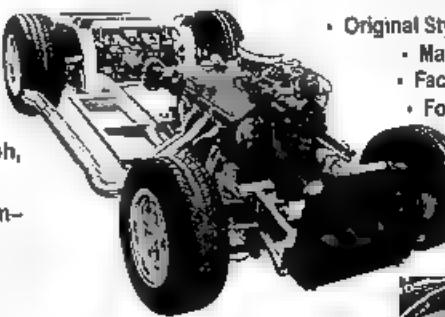
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"...the Corvette suspension was more composed than any of the others."

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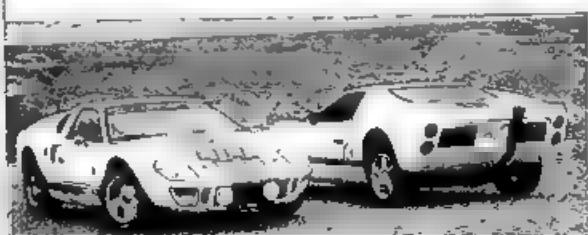


Club Sandwich

The annual Laughlin, Nevada, show is more popular than ever.

Text and photos by Dan Burnell

The Club Sandwich show featured a wide variety of cars—everything from neoclassics to Cords to Cobras.



Talk about a pair to draw to. David Hartman and Lance Allen show off their Fiero-based ASPP GT40s.



James Vaughn is still waiting for a new grille for his Allard, the final touch on an accident repair.



Tom and Diana Marquardt's Colorado GT40 Mark 1 replica body came from Tornado Sports Cars, England. The car took home honors for Best Engine, Best Paint, and Ladies' Choice. A stroked aluminum Olds V-8 provides plenty of power. Tom and Diana were concerned about having space in their GT to haul all the trophies home.

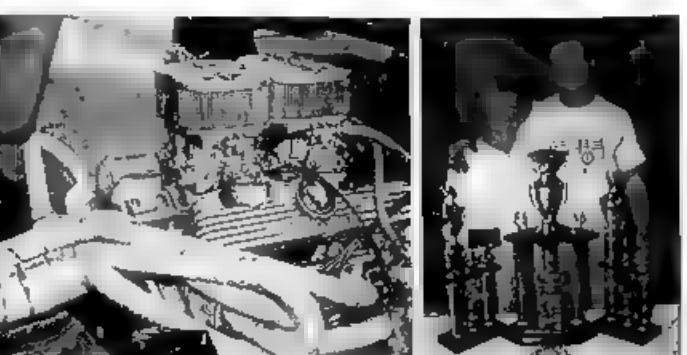
Once a year, in late October, a growing number of hand crafted automobile builders and owners make the drive to Laughlin, Nevada, for the annual gathering and car show of the Arizona Kit Car Club and the Association of Hand-crafted Automobiles.

Laughlin, located in the extreme southwestern corner of Nevada, is just across the Colorado River from Bullhead City, Arizona. The west side of Nevada borders California. Situated in the middle of the tri-state area, this annual event became known as the Club Sandwich—a great opportunity to get away from the city for a fun weekend with great people, sample some good food, and look at some great cars. It's also a chance to show off new projects, talk over new ideas, and do a little bench racing. On the entertainment side, Laughlin is a fun place to play the gaming tables, see a show, and just relax and have a good time.

The weather and the central location for the Southwest clubs make Laughlin an ideal location for the annual weekend event. And every year the River Palms Resort Hotel and Casino graciously donates its parking lot for the display area.

This event continues to attract more entrants and spectators each October. On Friday, the day before the event, about 60 beautiful, handcrafted automobiles and kit cars—along with several street rods—were on the road from Arizona, New Mexico, California, Nevada, Oregon, and as far away as Nebraska and Colorado.

Thus has become a popular event, and by late afternoon onlookers were in the parking lot watching as the dusty cars arrived, some driven, and some trailer. Within a short time, all the vehicles



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A Cobra B GT 350 C GT 500 D Mustang E Ford F NOTE: Applications now available for Chevrolet steering columns

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Club Sandwich

were restored to the beautifully painted, bright-chromed beauties typical of this event.

Two of these great cars showed up from Colorado. Tom and Diana Marquardt drove their GT40 Ford, while builder Joe Martin and owner Dave Swinney towed their award-winning Lambo out for the festivities.

This year's show featured something for everyone, with a wide variety of cars on display. In addition to the Marquardts' GT40, there were two Fiero-based GT40 look-alikes, a number of Lambos and Ferraris, a handful of fiberglass-bodied street rods, several neoclassics, a Cord, and several Cobra replicas.

October is typically an enjoyable time of the year in Laughlin with average daytime temperatures in the mid- to high-80s and a constant breeze blowing off the river. This year, however, the weather was a little different. With Saturday morning came sunshine and the breeze off the river, but about 4 p.m. the wind came up and the rain began coming down at a 45-degree angle. Thunder and lightning shot out from the dark clouds and the raindrops bounced off the dry pavement. The storm quickly passed, however. With a rainbow visible to the east, the parking lot was again full of people looking at cars and voting for their favorites.

The Arizona Kit Car Club and the Association of Handcrafted Automobiles—including members' spouses and volunteers—always do a great job with this event. It's well organized, well attended, and a lot of fun.

In addition to donating the parking lot, the River Palms Hotel and Casino provides the trophy and does the judging for the Best of Show award. This year, Rachelle Stevens—on behalf of Mitch Graham, casino shift manager—presented the top award to Rich and Sharon Young for their '65 Cobra.

The general consensus from those attending the Laughlin Club Sandwich is that the combination of good weather, great people, interesting projects, casinos, the river activities, and lots of spectators make for a great event.



This award-winning Lambo was handbuilt (no kit) by Coloradan Joe Martin during a period of several years. The car is owned by Dave Swinney and took home the AHA President's Award.

KC

AWARDS

BEST OF SHOW

Rich and Sharon Young, '65 Cobra

BEST IN CLASS OVER \$30,000

First Place: Tom Marquardt, GT40

Second Place: David Patal and

Lyn Morrow, '34 Mercedes

Third Place: David McLeod, Mable

BEST IN CLASS \$20,000-\$30,000

First Place: Jim Ferrier, Marlene

Second Place: Dennis Wenger, Cobra

Third Place: Clarence Johnson, Custer

BEST IN CLASS \$10,000-\$20,000

First Place: Mike and Vicki Dresbach,

Ferrari Dino

Second Place: Henry Van Antwerp,

'34 Ford three-window coupe

Third Place: Ben Barbee, Ferrari Dino

BEST IN CLASS UNDER \$10,000

First Place: Richard Maua,

LaDawri Conquest

Second Place: Jack Small, Beppi

Third Place: Frank Redmond,

Mini Mark

BEST PAINT

First Place: Ted and Rose Graer,

Cobra

Second Place: Dave Holland, Mable

Third Place: Tom Marquardt, GT40

BEST ENGINE

First Place: Tom Marquardt, GT40

Second Place: David Patal and

Lyn Morrow, '34 Mercedes

Third Place: Mike and Vicki Dresbach,

Ferrari Dino

BEST INTERIOR

First Place: Clarence Johnson, Custer

Second Place: Dennis Wenger,

Third Place: David Patal and

Lyn Morrow, '34 Mercedes

LADIES' CHOICE AWARD

Tom Marquardt, GT40

AKCC PRESIDENT'S CHOICE AWARD

Jim Ferrier, Marlene

AHA PRESIDENT'S CHOICE AWARD

Joe Martin and Dave Swinney,

Countach



Install a Manual Wiper

Here's a quick way to add a windshield wiper and satisfy some state safety requirements

text and photos by Jim Youngs



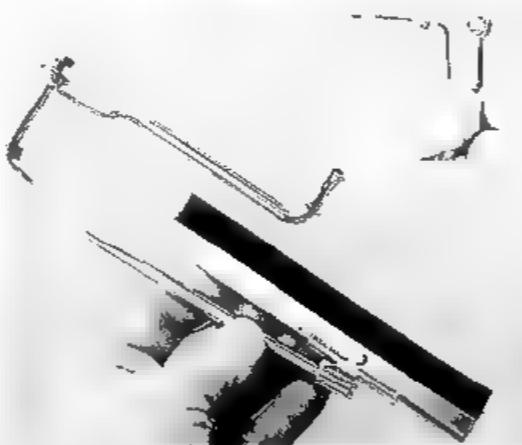
The Ron Francis windscreen wiper bracket is made of stainless steel with urethane blocks in between the two pieces. This prevents the bracket from marring the finish of the windscreen frame.

We acknowledge that laws governing automotive safety are for the most part a good idea. They are also typically written for the greater car community and often are at odds with specialty cars. We also acknowledge that most vehicle inspectors we've come across are rather ignorant when it comes to some things about our kit cars, no matter how much we argue. A case in point is windscreen wipers. They are safety items and can be downright handy when it comes to sweeping away rainwater.

Most states require at least one windscreen wiper, regardless of whether or not we roadster drivers will ever actually be driving in the rain. More than likely, we'll be sitting under an overpass or the overhang of a service station if a cloudburst appears, waiting for a break in the weather. At the least we'll have our windshields treated with Rain-X or some similar chemical that beads and repels water to provide a clear view. Explanations of those roadster facts tend to fall on deaf ears, however, and still our cars are required to be fitted with some sort of wiper.

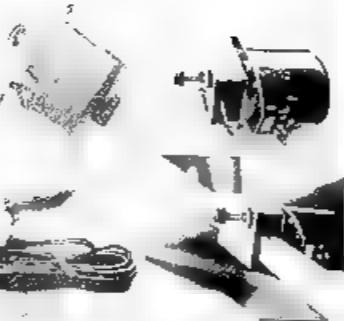
We've found a cool, inexpensive remedy to the wiper dilemma that doesn't require drilling any holes or attaching ugly blades to our cowlings.

Ron Francis Wire Works offers several configurations of a neat windscreen mounting bracket (\$26) designed to mount either a manual Model T-style arm and blade (\$30) or an electric wiper motor to the top of a windscreen. We discovered one that not only fits on our '32 Ford roadster frame, but also fits on a Cobra replica windscreen. Attaching either the bracket or motor couldn't be simpler. And if you think it looks goofy, you can quickly remove it.

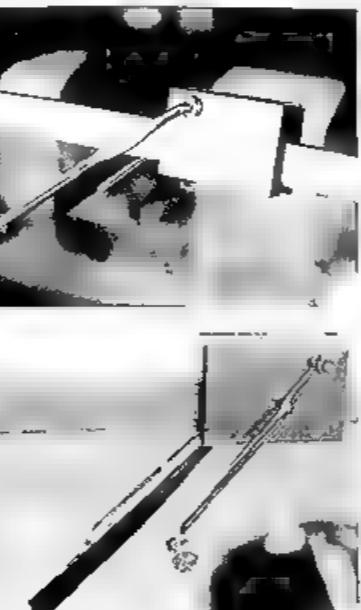


We found the manual Model T wiper at Total Performance and modified it to work with the Ron Francis mounting block. Two little tangs on the base of the wiper arm were removed to lengthen the shaft so it would extend through the block. Total also has windscreen-frame mounting brackets, but they are designed for the round shape of the frame. We had to shorten the blade since our windscreen on the '32 roadster is chopped 3 inches from stock height.

www.kitcarmag.com



The bracket could also be used with an electric wiper motor, such as this one we found at an auto parts store. It has a switch on the back for two-speed operation. By using a cigarette-lighter plug, the wiper can be set in place and used quickly. The motor accepts a standard, universal wiper arm and blade setup.



As you can see, the system is simple and quick, and it serves several functions. We like the way it looks, but it can be removed and stowed away if you wish.

KC

SOURCES

Ron Francis Wire Works
Dept. KC
167 Keystone Rd.
Chester, PA 19013
800/292-1940
www.wire-works.com

Total Performance
Dept. KC
400 S. Orchard St., Ste. 5
Wallingford, CT 06492
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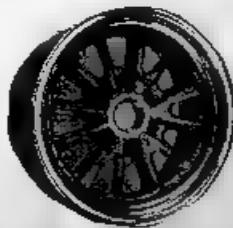
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15 or 17" S/C type



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Make Side Vents

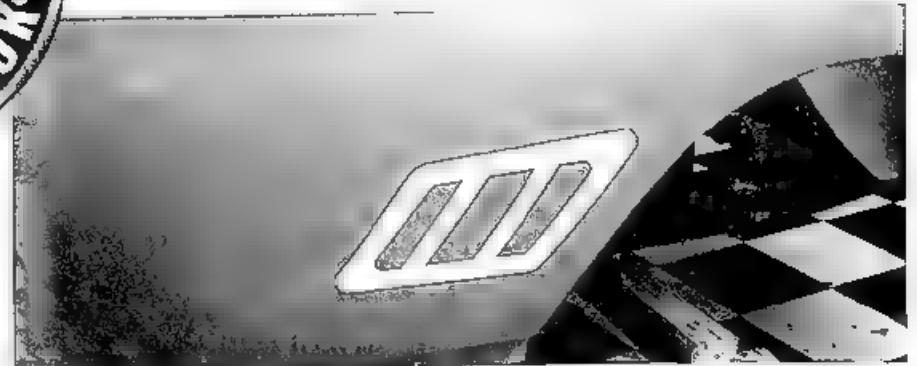
Our project Devin lets off some steam

text and photos by Harold Pace

Side vents are functional trim items that can be useful on many types of kit cars. Ferraris vent on top of their front fenders, Cobras vent on the sides, and Countachs and Grand Sport Vettes vent nearly everywhere. If your kit doesn't have vents where you need them, here is a simple way to make them from aluminum sheet.

Devin SS models such as the one I'm building didn't come with side vents, but owners soon discovered that more air rushed in the big grille than could escape under the car. For street use in temperate California it wasn't a big deal, but racers needed more cooling and began cutting holes in the sides clear back in the '50s. As the factory wasn't installing them, each set of vents was different.

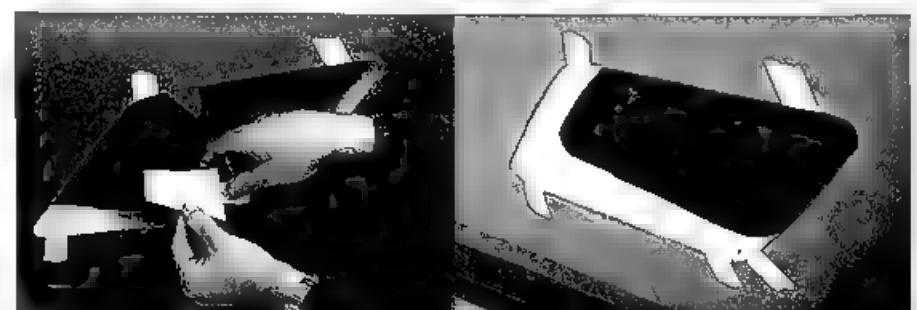
Since I live in Texas and it gets quite hot on the track in the middle of the summer, I elected to add vents to my car. For inspiration I looked at photos of every SS I could find that had added vents. I picked a car—raced by John Brophy in California—that had rather large vents angled back to match the fender line, as my guide. It also used only two louvers, so it didn't look too much like a Cobra vent (enough people mistake Devins for Cobras as it is). Here's the step-by-step.



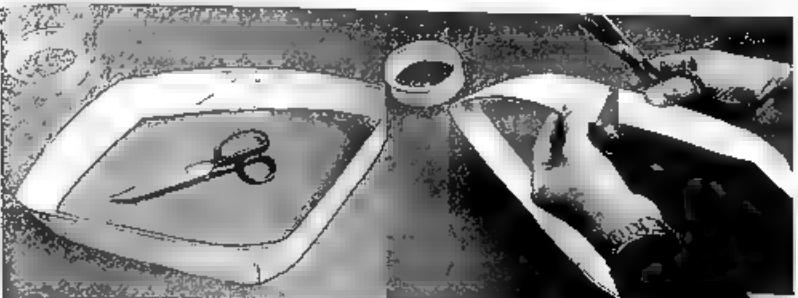
Begin by mocking up your design in masking tape, and if possible leave it on the car for a week or so before making a decision. It's a lot easier to change your mind at this stage than later.



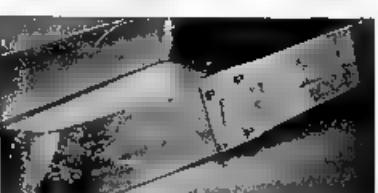
In one corner, drill a hole big enough to fit a saber saw blade into. Then cut out the vent using the saw. Make sure your design uses a generous radius on each corner to prevent cracks from forming. Gently sand the edges to a smooth curve.



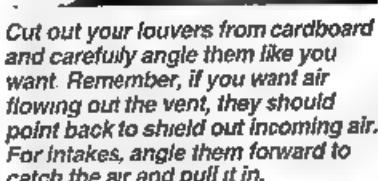
Make templates for the surround piece and louvers. Use thin cardboard and masking tape—be as exact as possible. Making good templates is probably the most important step in getting good results. Here we are forming an outer rim for the vent. You can make the ends flat or curved to match the angle of the louvers you will be installing later. I opted for the latter approach, although it is much more work. Be aware that you cannot form the surround from a flat piece of 2-inch aluminum strip because of the number of angles. Making a good template can save you a lot of scrap metal.



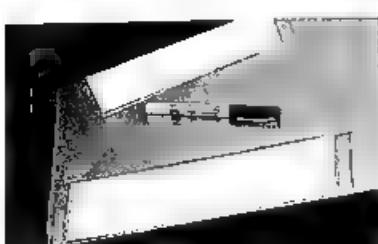
Here is our completed rim removed from the car. You can make it as wide as you'd like (and have clearance for). Cut the surround apart at the center of the top. The join line will not be visible when installed.



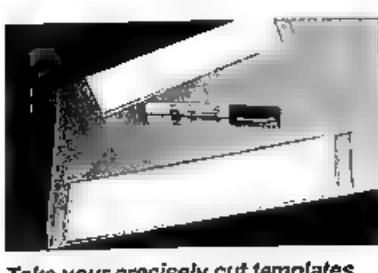
Cut a small piece of aluminum, drill a hole in each corner, and rivet it across the top of the joint.



Cut out your louvers from cardboard and carefully angle them like you want. Remember, if you want air flowing out the vent, they should point back to shield out incoming air. For intakes, angle them forward to catch the air and pull it in.



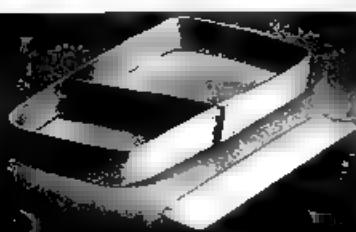
Bend and shape the surround until it fits snugly against the hole and has the angles you want on the ends. You can make it fit flush with the opening or step it back some. Tape it in place and check your workmanship. Better to rework it now than later.



Take your precisely cut templates and lay them out on rigid aluminum (you will probably want it to be thicker than the surround, but it's up to you). Before you begin cutting, add an extra $\frac{1}{8}$ inch to the top and bottom of each louver and mark the aluminum to show the angles of the top and bottom of each louver. Note that the louvers may not be the same size so mark them with a grease pencil.



After cutting out the aluminum louvers, notch them halfway across from the backside using tin snips or a saber saw. Make the notch the same width as the surround. Then notch the surround from the front side back. Make sure you have the angles right—double-check with your cardboard templates—before you begin cutting. Then gently file the edges smooth.



Shown here is the side vent slotted together. Round the outside corners on the louver extensions to prevent them from hitting the body (note black mark).

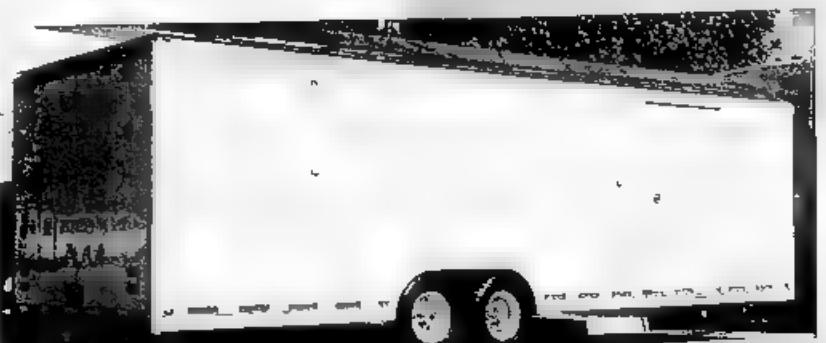


Tape the completed vent into position. You can attach it with RTV adhesive, or fiberglass it in place from the back. I plan to make L-brackets that attach to the firewall on one side and the fenderwell on the other. The vent will be attached to these brackets with screws or rivets. Aluminum louvers can be polished, painted, powdercoated, or—if they are made from the right aluminum alloy—anodized. Check with your plater for appropriate alloys. KC

Trailer Tire Safety

How to avoid disasters while towing your kit car

text and photos by Robert Eckhardt



Trailers carry one of your most prized possessions—your expensive kit car—to races or car shows. While only about 10-20 percent of our readers trailer their cars, the information in this article applies to anyone who buys tires for any purpose.

all tires, we have an initial load formula we use based on the cavity dimensions. The cavity dimension gives you a volume of air space. For an equal volume of air space, the trailer tire is designed to carry

more load. The trailer manufacturers have designed their trailers to sit low enough so that when you are off-loading things you don't have to have big ramps."

PLIES NOT IMPORTANT

The basic construction of trailer tires (ST, Special Trailer) is similar to a light-truck tire. On the sidewall of the trailer tire it reads two plies of polyester and two plies of steel. The difference is the polyester cords in trailer tires are usually bigger than they are for a comparable light-truck or passenger-car tire. Typically, the steel wire is going to be a larger diameter or have a stronger tensile strength to meet the additional load requirements.

Underinflated tires are the number-one reason for tire failure, and ignored trailers are particularly vulnerable to such neglect. Even on passenger vehicles, 80 percent of the tires are below their recommended pressure. Tires lose 1 pound of pressure per month and 1 pound for every 10-degree drop in temperature. In six months, a tire can be down 10-12 pounds of air—up to half of its pressure—and not appear to be flat! Not only are underinflated tires dangerous, but also they wear out faster and contribute to poor gas mileage.

Since trailering is something we may all consider from time to time, we thought this a good opportunity to look into trailer tires. We guarantee you probably have never heard or read about some of this information elsewhere.

DIFFERENT LOAD FORMULA

There's a difference between light-truck or passenger-car tires and trailer models. Trailer tires are developed to different load formulas. The materials and construction are designed to meet the higher load requirements of trailering.

We contacted Goodyear and asked Tim Fry to explain about today's trailer tires. He says, "By changing the load formula, it changed the way we engineered a tire and we got a better-performing tire. We had to go back and change some of the parameters of the tire, primarily the tread depth. Trailer tires typically don't wear out. This is from lack of service or because they're in a free-rolling position. You don't have any cornering forces that tend to wear the tread out as you do on motorized vehicles. On passenger-car tires, we typically run about $\frac{1}{2}$ inch in tread depth. A deep-lug truck tire can be $\frac{1}{2}$ inch deep. A trailer tire will generally run about $\frac{1}{2}$ inch."

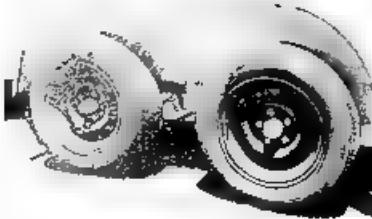
A tire with deep treads runs much hotter. Running a tire in high load conditions, at high speeds, and underinflated all build heat in a tire. Excessive heat causes tread separation and can destroy a tire.

Says Fry, "The load capacities of trailer tires are different than light-truck and passenger-car tires. In designing

TIME LIMITS

There are time limits put on all tires by the manufacturers. They are not generally enforced, but with the current state of tire-related lawsuits, you can expect to see more tire warranties emphasizing the time limits on tire life. When a tire reaches that time limit, even if it has plenty of tread life left, it will be considered worn-out and must be replaced.

Passenger-car or light-truck tires will typically wear out in that three-to-five-year time frame if you figure most



Never use passenger car tires (P) on a trailer. Only trailer (ST) tires have the load-carrying capacity to support heavy loads. Even when properly inflated to their load capacity, these tires flatten out, as evidenced by the rounded edge of the tire. This trailer fishtails excessively because the weight overloads the tires' sidewalls.

people drive 12,000-20,000 miles a year. Trailer tires are a different story. A trailer may go only 2,000 miles a year and over five years will only have 10,000 miles of use. The tires will look good as new, but there may be internal structural weakness.

The time problem relates to oxygen. When you have oxygen content in your tire under pressure, it is going to force the oxygen molecules to react internally in the tire and break it down slowly. A tire is made from natural and synthetic rubbers and chemicals, which all break down as part of a natural phenomenon. When you add in the oxygenation occurring on the outside of the tire, and the effects of the ultraviolet rays from the sun, it's obvious a tire will not live forever.

SPECIAL TRAILER (ST)

When purchasing or replacing tires on your trailer, it's best to look for tires with the ST (Special Trailer) designation. Never use a passenger-car (P) tire on a trailer. It will not handle the loads required. Some light-truck (LT) tires will handle the weight of a trailer, but you must choose them wisely.

We contacted Leo Garbarino at Carlisle Tires for his recommendations. "A trailer tire is constructed for a load and built to be towed," he says. "Passenger tires are not built to handle a load. Light-truck tires are designed for light trucks. They do cross over into some heavier trailer applications. There are medium-duty, light-truck tires that do well on lighter trailers, but it depends on which size tire you are talking about.

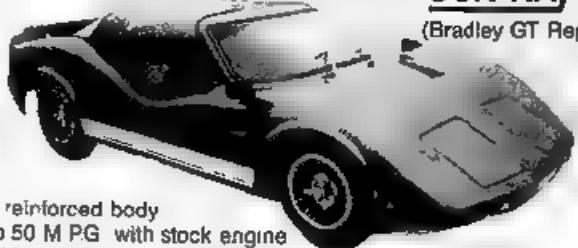
"The ratings on ST tires are specifically geared for specific axle ratings that are standardized on trailers. If you have a 5,000-pound axle, you will use a tire that is rated at 2,540 pounds, so that two tires will meet

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the 5,000-pound requirement in weight-carrying capacity. A light-truck tire is not rated the same way. Typically, the light-truck tire ratings are not built to match the axle ratings. Lastly, truck tires are generally more expensive than trailer tires."

NEW SIZE TIRE

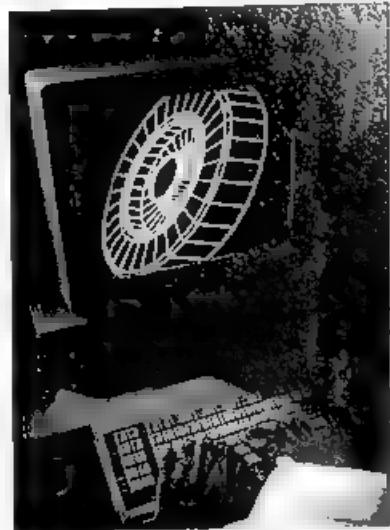
Ray Evans at Titan Tire shared this information. "In light-truck tires, oftentimes the pressures are too high for trailer use. The tire is also too heavy. It is more geared for heavier loads and higher inflation pressures that are not needed in a normal trailer tire. It results in too harsh a ride for trailer use. The ST trailer tire is really in between a passenger and light-truck tire, but it does have a unique construction built into it."

"We have brought out a brand-new-size tire that has never been made before—a ST235/80R16. We made it in a load range E, with a maximum load-carrying capacity of 3,520 pounds. Why that is so unique is because people were using a LT235/85R16 truck tire, but those tires were only rated for 3,200 pounds. So pulling a trailer that had a 7,000-pound axle with those LT tires, they were under-tired."

By now you can see that the load rating of the tire is the most important consideration when choosing a trailer tire. It used to be that you could look on the sidewall of the tire and determine its strength by the number of sidewall and tread plies. In the last 15 years, the Tire and Rim Association has allowed tire manufacturers to use a six-ply rating on a tire that may only have four plies as long as it meets the carrying capacity. So today, the amount of plies has little bearing on the strength of a trailer tire. Generally, trailer tires have stiffer sidewalls for more towing stability.

BIAIS VERSUS RADIAL

One old wives' tale was that you never put radial tires on a trailer. The sidewall was too soft, allowing the trailer to squirm around all over the road. That's not necessarily true today. Titan's Ray Evans explains: "Generally, the biased-ply tire can be more stable than the radial. It has more sidewall stability. If that is a factor for you, stay with the biased tire. If you are going to do a lot of long-distance towing at high speeds, the radial gives you more of a safety factor because it runs cooler. The construction is inherently a cooler."



Tire companies spend millions of dollars designing tires that are capable of carrying tremendous loads. Follow the load rating information on the side of the tire sidewall. It is more important than how many steel or polyester plies the tire has. The tire's load rating is only good if the tire is at its maximum air pressure.

running design and more forgiving of overload conditions. A biased-ply tire will give you more stability if you're pulling a heavy load. I'm talking about transitional stability when you're changing lanes. The biased-ply tire is a little less expensive than the radials."

Carlsle's Garbarino adds, "The radial is going to improve your fuel efficiency, give you better tire mileage, and last longer. The plus of a biased trailer tire is the sidewall is stiffer so there's less flex. That will allow the tow vehicle not to feel the sensation of fishtailing. The ridge sidewall contributes to the trailer moving down the road a lot straighter. The bias tire has the same load capacity as the radial. The negative of a radial trailer tire is the sidewall flex. It could give you fishtailing of the trailer."

The answer here is both constructions are fine as long as they meet the load requirements of the trailer. It's a personal preference as far as the towing quality because both designs are built to the same load formula.

LOAD RANGES

The most critical factor in choosing a trailer tire is its load range. You can find the load rating molded into the sidewall of every tire. The load rating tells the true story in a tire's

ability to handle load. You want to look for C, D, and E load ranges, towing. In addition, you must understand that load ranges are based on specific inflation pressures. With a higher inflation pressure, you're able to carry more weight. Therefore, a load range C tire will be at its peak load capacity when it's inflated to its maximum pressure of 50 psi. When you go up to the next load



Typical tire construction has multiple types of belts and plies. The same size tire may have different load ratings because of the use of extra belts or plies with higher tensile strength.

range—D—the tire will need to be at 65 psi to handle the increased load capacity. Load range E tires must be set at 80 psi.

Goodyear's Fry says, "The same size tire can have three or four load ranges. You will see a difference in the cords and belts. In the case of the Marathon tire, we use the same cord for the carcass of the tire in the load range C and D tire. To make them different, we use a different steel belt wire in the tread. For the load range C tire, we have one layer of nylon over the top of it. For the load range D tire, we put on two nylon layers. We can also use different belt wire and other materials to increase load capacity. In reality, they are different tires even though they're the same size. The customer will recognize that because the prices are different. When they go in for a C tire, it will be close to a passenger-tire price. When you get into a D load rating, that will be somewhat higher. The E rated tires will cost more than D tires because we put in materials that are more expensive. If you don't understand load range, you will understand price."

Another thing different with trailer tires is they are not speed

rated as passenger-car tires. The manufacturers generally believe the maximum speed limit for a trailer tire is 65 mph.

THE ONLY WAY

In order to buy the correct load-rated tires for your trailer, you must first weigh your trailer fully loaded. This means with your car, gasoline, tools, and ice chests full of liquid refreshments on board. Go to a truck stop or public scale and weigh the entire loaded trailer. While there, weigh each axle separately, and weigh the tow vehicle along with the trailer. This will let you know if you are overloading one of the trailer axles and if you have exceeded the tow ratings for your tow vehicle.

There are other considerations for choosing the correct trailer tire. In order for the trailer tires to manage the weight of the trailer, all the tires must be the same. Do not mix biased and radials together. The size of each tire should be the same and have the same load rating. They should have the same amount of tread wear. This becomes critical when replacing a tire because of a blowout.

Tire manufacturers upgrade tire lines and may change the construction of the tire. The overall size can change year-to-year for the same size and model of tire. Measure the outside diameter of your old tire versus the new tire. Always run the same size outside-diameter tires on the same axle. A shorter tire will carry



Trailer tires will have the ST designation followed by the tire size on the side of the tire. Trailer tires are designed for stability and straight running, so they generally have square tread patterns and stiffer sidewalls.

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more weight and may become overloaded. In a dual-axle application, the tires should match front to rear as well as on each axle. When you are braking, the load on the front tires increases. If you are running near the load capacity of the tires and the weight shifts forward under braking, you are temporarily overloading the front tires. This is especially true if you have brakes on the front axle. You are putting a tremendous amount of stress on the front tires.

The tire pressure is set according to the load capacity of the tire. The pressure is set when the tire is cold. As you drive, the tire will heat up and the pressure will increase. That's what it's supposed to do. When you set the pressure at 60 psi cold, it might be at 65 psi down the road. Do not let the air back out to 60 psi. Set them cold and leave them alone.

Carlisle's Garbarino cautions, "Even if the tires are not at max load, you should still maintain the pressure at max pressure. The tire will perform better. There is no advantage to taking air out of the tire. You will get better mileage and wear with a properly inflated tire."

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BOSS

JAMAICAN TIGER



KEITH KAUCHER'S

KIT CONCEPTS

text and illustration
by Keith Kaucher

In 1968 the number of kit car manufacturers could be counted on one hand. One of the better known was FiberFab. It made various kits such as GT40 look-alike Avengers and Valkries, a body

kit that transformed a '65-'66 Mustang into a European GT, and the Jamaican Tiger, which bolted onto an Austin Healey 100M chassis.

The Tiger's body had a one-piece flip-up front clip similar to that of an XKE Jag. The styling was a mix of Euro GT and American musclecar. Many Tigers retained the anemic Austin four-banger, while others transplanted small-block V-8s.

In 1990 I found a Tiger complete with a 289 Ford between the Brit framelines. I bought it for \$100 and immediately planned a long list of mods. But college—and life in general—had different plans for my time. Eight months passed while the car sat in my dad's yard. He didn't share my vision for the car's future and insisted I find a new home. Luck was somewhat on my side and I sold the car untouched for \$1,400 to a teenager.

I was recently thumbing through some old photos and

found some of my Jamaican Tiger. I thought you might like to see what I had in mind for it. Of course, I updated the plans a little to make sense in 2001.

The Tiger's wheel arches didn't leave a lot of room for tires, so fender flares were called for. The taillights from a '70 Mustang adorn the rear of the car, as does a '97 Corvette license plate housing mounted in the center with backup lights. Side vents integrate well with the styling and act as waste gates for the engine-compartment heat. Boss-style stripes accentuate the muscular lines of the body. The car rides on a set of Edelbrock 454 high-luster-finished 17x8-inch wheels. Corvette disc brakes will be necessary with a built Boss 302 twisting a Tremec five-speed.

At 2,200 pounds, this car is probably more Cheetah than Tiger. KC

Editor's Note: Be sure to check out Keith's Web site at www.kaucherdesignwerks.com.

BUMMER

TALK OF
the down-
and dirty
crowd

A Corvette Yellow galore was the source from a Jeep Wrangler provided by Tatonka Products.



Leaders of Kit Car are accustomed to seeing the flowing lines of a Cobra, the immortal beauty of a classic Bugatti, and the powerful bulges of a Lister or D-Jag replica. Not this time. Instead, we present you with something that has the flowing lines of a brick and the aerodynamic characteristics to match. It places function ahead of style. It's called a Bummer.

The Bummer comes from Tatonka Products—a Salt Lake City, Utah, group that has long specialized in building custom fiberglass molds for the industry. It isn't clear from what deep, dark recesses of owner Richard Tolbert's mind the

Bummer idea came, but Tatonka has sold nearly 120 Bummer kits during the past few years and shows no sign of slowing down.

The utility-type bodies are designed for pickup and SUV chassis. Tolbert says it's the ultimate way of recycling a truck that runs good and looks bad. The resemblance to the military Humvee is obvious, but the dimensions and proportions are completely different. The Bummer kit will fit most Chevy, Dodge, and Ford pickup chassis, as well as many full-size SUV chassis such as the Suburban, the Blazer, the Ramcharger, and the Bronco. Tatonka is

currently working on a scaled-down kit to fit the GM S-10 chassis and other smaller trucks.

The Bummer can be configured as a short- or long-wheelbase, two-door pickup or a four-door people mover. At least one Bummer is being built on a 164-inch-wheelbase, crew-cab chassis and will have six doors. The body is only slightly wider than the original truck, but it utilizes more interior space due to its boxy proportions. As a result, four-across seating can be accomplished. This allows the two-door pickups to seat four, the four-door to seat eight, and the six door to seat 12. Most Bummers are built

as ragtops, but a hardtop will soon be available for fully enclosed comfort. Hard or soft doors are available according to taste. In the case of two-doors, Jeep Wrangler doors can be used.

The conversion of pickups is relatively simple and straightforward. No serious special tools are needed. Blazers, Suburbans, and other SUVs with rear-mounted fuel tanks are a bit more difficult. The necessary chassis modifications at the back are complicated by the fuel tank. One relatively easy cure is the mounting of pickup-type saddle tanks. Other ideas include a custom tank or alterations to the kit that leave room for the original

fuel tank. Most novices report being able to complete a standard installation on a pickup in 80-100 hours. Some owners have reported being able to get the body installed over a weekend with a little "armstrong" help.

The beauty of the Bummer conversion is that it automatically improves the performance of the vehicle on and off the road with no mechanical mods. The new body has wheelwells that allow the installation of tires up to 38 inches tall with no suspension lift. The loss of weight improves overall performance and increases drivetrain durability. The option of bigger tires increases clearance

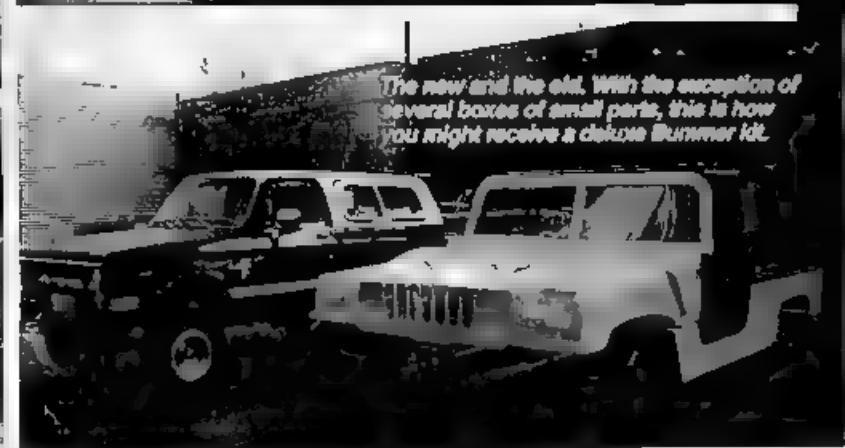
and adds traction. The bigger tires may require a gear-ratio change.

In the case of pickups—especially $\frac{1}{2}$ -ton and 1-ton units—the loss of weight results in a vehicle that may be much oversprung. The softer-riding SUVs and $\frac{1}{2}$ -ton pickups are less affected. The best idea is to figure on derating the springs as a part of the conversion. Spring rates similar to light-duty, $\frac{1}{2}$ -ton Blazers or Suburbans seem about right for most Bummers.

The Bummer featured here is called the Bum-V. It was built on an '83 Blazer diesel chassis and configured as a short pickup with sideboards. As a Blazer, it



The interior is sprayed with a gray bedliner material, and the dash is fitted with a full complement of Auto Meter gauges.

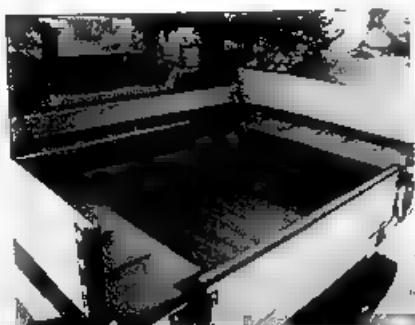


BUMMER!



A tale of two chassis. In the foreground is the Blazer chassis after some of the modifications were complete. In the background is a partially modified 1-ton Chevy pickup chassis. Note the difference in stepdown between the truck and the SUV chassis. For SUVs, the body must be supported in the center by "stilts." This is not necessary for the trucks. The GM SUVs have particularly weak chassis in comparison to the trucks, especially the ½-ton Suburban. Tatonka recommends using a truck chassis over a ½-ton Suburban if at all possible.

had already been heavily modified for trail performance, but the installation of the Bummoer kit greatly enhanced the vehicle's performance. As an overbuilt, heavily modified Scottsdale Blazer, it weighed nearly 6,400 pounds. When put on the scales after the conversion, the Bum-V weighed in at just 3,860 pounds. That's lighter than some Jeeps, and it was enough to cut a full 2 seconds off the diesel. Blazer's best 0-60 time of 14.4 seconds

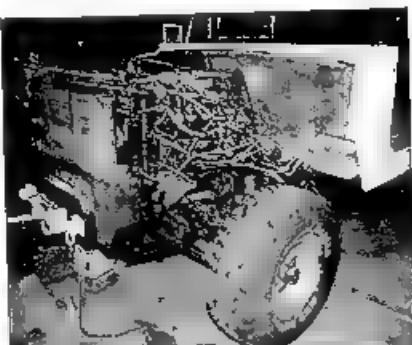


Its bed measures 4x5 feet in width and 5x6 to the bed rails. It's tall enough to carry useful loads. We've loaded it with a load of garden fertilizer and some cushions; it could make a great personnel carrier. It seats six, facing forward, Army-style.

New front, rear, and center cross-members have really tightened up the chassis, both on and off the highway. It

feels a little better in turns, and surprisingly, significantly less chassis flex or difficult handling. A notorious GM trait, which eventually results in cracks, has been addressed. As expected, the Vortec V is a bit over-revved now, but a lighter set of custom springs is in the works. There's now room to fit the 35x12.50-15 tires without them looking too small, with some 37- or 38-inch mentis.

With the loss of weight, the drivetrain can now handle the extra rubber. On the trail, the loss of weight has translated into better performance. The vehicle climbs easier, descends more slowly, and the torque converter feels tighter. Since converter stall speed is partly dependent on vehicle weight, less weight has the effect of lowering the stall speed. Flash stall, the peak, full throttle "launch" rpm, has dropped 250-350 rpm. Most of the weight was lost in the rear and the truck is now a bit more nose heavy. That has translated into more pull from the front end on hard climbs.



Six to eight inches is trimmed from the front of the chassis and a new crossmember is attached. In this case, Tatonka also built a custom integrated winch mount. A custom-fabricated radiator support was built to carry the huge diesel radiator, a big tranny oil cooler and the A/C condenser. It was not feasible to use the OE fan in this case, so a high-volume, commercial Flex-a-lite dual-electric was used. The aluminum firewall plate serves well as a central electrical ground. This shot was taken prior to the installation of the brake booster and the steering column.

Building the Bum-V was more difficult than a gasoline-powered pickup conversion for two reasons: the aforementioned fuel-tank difficulties and the diesel engine. We talked about the fuel tank, but the dimensions of the diesel, and its massive radiator forced Tatonka

to design for the production kit and go completely custom for the radiator mounting. The body also had to be moved forward slightly. Fortunately, there is considerable leeway to position the body as needed to cover unforeseen problems.

The Tatonka kit is available in a bare-bones form or with lots of extras such as a roll cage, doors, and top. There is an almost infinite variety of accessories that can be added and the choices in outfitting are numerous. Some owners have outfitted Bummers quite luxuriously, while others build them in a spartan "hose-out" form. Because it has built many Bummers in-house, Tatonka can supply useful information on what works and what doesn't.

In four-wheeling circles, the Bummer is a head turner. Wise chiropractors will follow you around, dispensing business cards and drumming up whiplash business. Park it in the grocery store parking lot and you'll find five people ogling when you come back out. But, total functionality has a beauty all its own.

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BUMMER!



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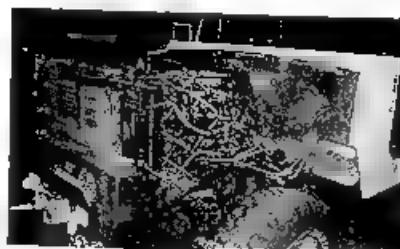
The pickup bed measures the well and 5x6 to be big enough to carry useful items. It's large enough to hold a personnel carrier. It seats inward, Army-style.

New front, rear, and side members have really tightened up the chassis, both on and off the

truck holds a line better in turns and, surprisingly, significant chassis flex on difficult trails—a notorious GM trademark that eventually results in cracks—has been much reduced. As expected, the Bum-V is a bit over-sprung now, but a lighter set of custom springs is in the offing. There's now room to replace the 35x12.50-15 tires that look too small with some larger 37- or 38-inch meats.

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Street Dreams

A tale of two guys, and a stunning raging bull of an exotic

text and photos by Dan Burnell



Joe Martin is no stranger to the world of kit cars and hot rods. He's also a guy who has his priorities in order.

Thirteen years ago, Joe worked for now-defunct Exotic Dream Machines (builders of custom, tube-chassis Countach replicas), which gave him a great deal of sweat-equity, hands-on experience, and insight into the workings of kit cars, fiberglass construction, and powertrains. It also turned him into somewhat of an elitist when it comes to kit cars—as you'll discover later in this piece—having literally seen the best and worst of the business. As for having his priorities in order, let's just say Joe's home shop completely dwarfs his home by a significant margin. He says that will change when he converts his shop into his living space and then builds an even bigger workshop.

Joe always wanted to build a car for himself, so several years ago he set aside his other personal projects. He had seen enough bad Lambo bodies (and had even acquired one) to know he'd have to do his own thing and virtually start from scratch, working from his own designs. He scrapped the Countach kit body and began

massaging a collection of various Lambo parts into something he could work with. He also thought ahead enough to make his own molds in the event he would ever consider starting his own business.

Next he located a donor vehicle, dragged out the torch and the welder, and he was on his way. But as everyone knows, when you have to work for a living (Joe is a welder who builds auto manufacturing-related heavy equipment), projects such as this take a lot of time. He began the chassis for the car you see here in 1994 and the completed car made its debut at the Club Sandwich show in Laughlin, Nevada, in October 2000.

One day he showed up at Joe Martin's shop door with a box of parts and inquired, "Can you build me a car?" Dave wanted a Countach. For years he had dreamed about prowling the streets in a Lambo kit car. Though he had owned several Corvettes, he was looking for something more exotic to satisfy his desire. Joe certainly had the knowledge, the experience, and a fairly good start on the foundation of a solid car. A deal was struck and Joe turned his project into Dave's project, going back to the drawing board for some more refinement. The short story is that a good working relationship developed, and a spectacular show-winning street machine emerged as a result.

"The first thing was to design enough cockpit room into

the car so the average-to-tall person would be able to get in and drive it," Joe says. "After slightly raising the roof in the front to allow for adequate headroom, I had to find a donor windshield to fill up that big hole." A cut-down windshield from a Ford Aerostar turned out to be the correct fit. The side and back windows are custom-made using tempered glass.

Next, Joe checked the body measurements. The tubular frame was modified slightly to accommodate some of the changes. It's a Martin-designed steel space frame with the actual construction employing various-sized rectangular and square tubing. This chassis is designed to accommodate many of the Fiero donor-car components as well as aftermarket gear.

The body is a hand-laid fiberglass structure, with Coremat added for additional strength. Once the body was mounted on the frame, remote-door actuation switches were installed and the highly modified wing was mounted.

"I really like this design," Joe tells us. "The long, low nose and the slipstream design of the car make it look like it's moving even when it's parked."

Joe and Dave both wanted a smooth ride with responsive handling, so Joe used modified Fiero components for the

Street Dreams

A tale of two guys, and a stunning raging bull of an exotic

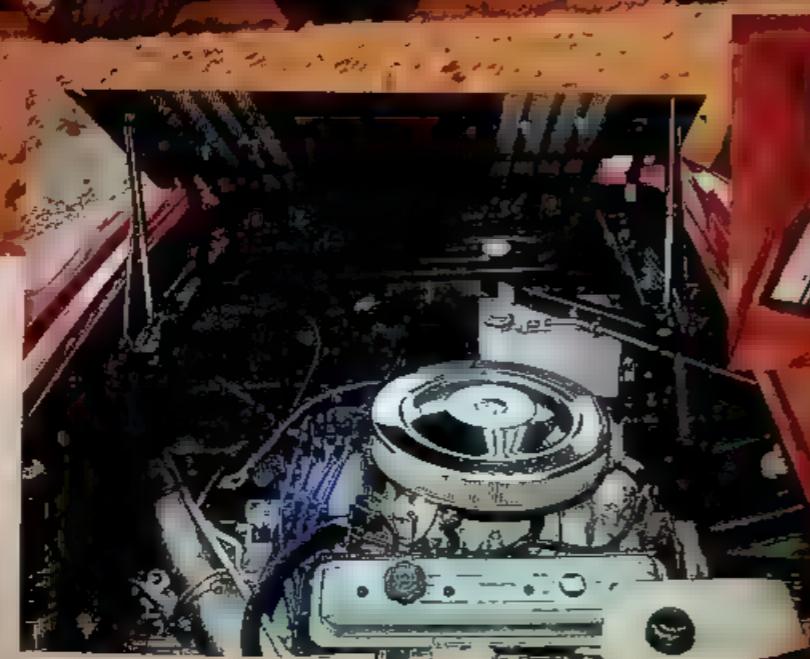
text and photos by Dan Burnell



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As fate would have it, about three years ago Dave Swinney unexpectedly showed up at Joe Martin's shop door with a handful of parts and inquired, "Can you build me a car?" Dave wanted a Countach. For years he had dreamed about prowling the streets in a Lambo kit car. Though he had owned several Corvettes, he was looking for something more exotic to satisfy his desire. Joe certainly had the knowledge, the experience, and a fairly good start on the foundation of a solid car. A deal was struck and Joe turned his project into Dave's project, going back to the drawing board for some more refinement. The short story is that a good working relationship developed, and a spectacular, show-winning street machine emerged as a result.

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the car so the average to-tall person would be able to get in and drive it," Joe says. "After slightly raising the roof in the front to allow for adequate headroom, I had to find a donor windshield to fill up that big hole." A cut-down windshield from a Ford Aerostar turned out to be the correct fit. The side and back windows are custom-made using tempered glass.

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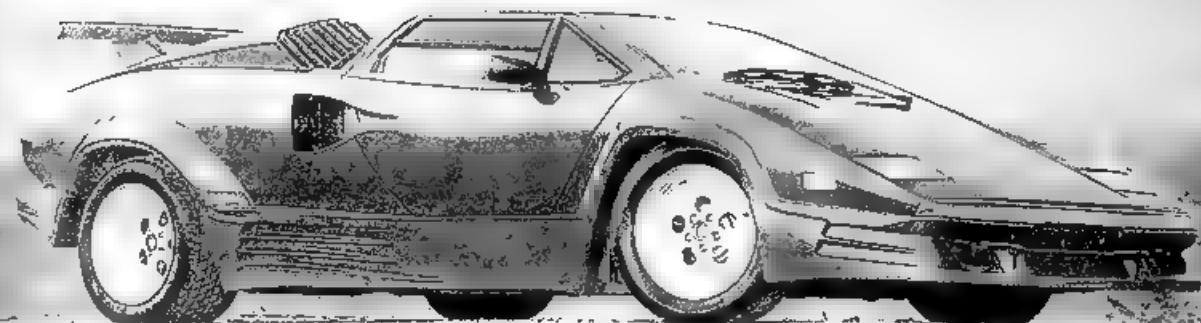
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ON - RAMP

Street Dreams



front and rear suspension. The front employs Aldan coilover shocks, while the Fiero rear struts are modified for coilover springs. This setup allows for adjustment in ride height, spring rate, and damping rates. Since approximately 80 percent of the stopping is accomplished with front brakes, custom hubs with 10 inch rotors were installed. The rear brakes are stock Fiero units. The wheels are Centerline Champ 500s—15x8 up front and 15x10 in the rear. The polished alloys are shod with Yokohama AVS tires with 225/50 ZRs and 285/40 ZRs, respectively.

Wanting the car to be as fast as it looks, Joe installed a 350ci small-block Chevy with throttle-body fuel injection. The engine is mated to a Fiero five-speed Getrag transaxle using a combination of Zurnalt axles and custom-made components for strength. The power transfer takes place through a beefed-up clutch and adapter kit from PISA. Custom headers were fabricated and Flowmaster mufflers with dual Anza tips create a mellow, satisfying sound.

The attention to detail is remarkable. Joe spent numerous, painstaking hours making sure every part of the vehicle fit as planned. Once he was satisfied with the bodywork and the fit, the paint was ordered. After some deliberation, Joe and Dave decided to use a three-stage custom orange mix by House of Color. The effect is stunning, and at different angles and different times of the day, the paint takes on different colors and gives the Lambo a changing personality.

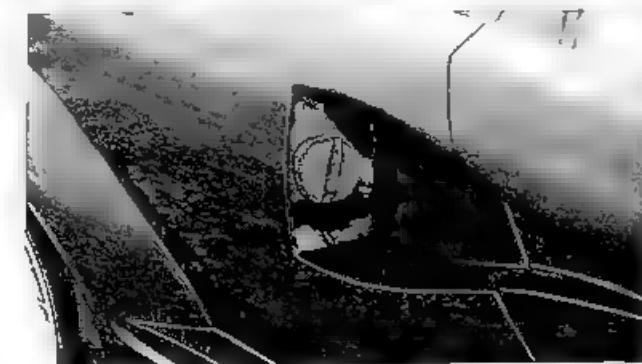
For the interior, Dave selected Dr. John's Auto Trimm in Denver, Colorado. There, John Edwards took special care in making sure the installation of the headliner, carpet, and leather equaled the workmanship of the rest of the car.

Due to the sharp angles of the doors, the windows only roll down 2 inches, so air conditioning is a must. Looking at the size, the stock Fiero unit was a natural fit in the car. A set of Classic Instruments Elan GT-series gauges keep track of the engine's vitals, while Alpine stereo provides the cockpit entertainment.

This car is definitely not for a driver who wants to assume a low profile. Dave lives in St. Louis, and twice the car has been mentioned on the radio because an announcer happened to see it on his way to work.

"All the money and hard work that went into building this vehicle paid off when, on its first time out, the car won the President's Choice award at the Laughlin show," Dave says.

Dave now tours the country in the car of his dreams, and Joe is—well—let's just say he's considering another project for himself. We'll just have to wait and see if he's able to keep it.



SOURCE

Joe Martin
303/232-7352

TAKE A SPIN

Kitcarmag.com puts you in the information express lane with direct access to parts and services vendors, and fellow buildup enthusiasts. Not to mention news, thousands of articles, photos and how-tos; contests; info on events; plus free e-mail. Kitcarmag.com. Custom built for digital drivers.

KITCAR
THE CAR BUILDER'S AUTHORITY

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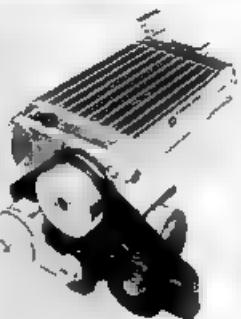
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OFF THE SHELF



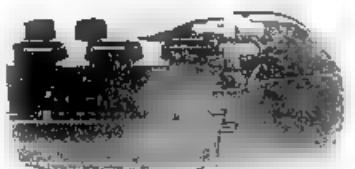
FORD EFI HARNESS

As more and more Cobra and street rod builders employ late-model Mustang 5.0 (and 5.8) engines, one of the difficulties of such an installation is a suitable wiring harness that connects the engine-management system to the engine. Painless Performance has introduced a new fuel-injection harness for these engines that includes the proper Ford connectors and high-temp TXL wire. This harness eliminates the nonessential connectors and is lighter than a stock harness. The Painless harness connects directly to the stock ECM with no reprogramming required. Contact: Painless Performance, Dept. KC, 9505 Santa Paula Dr., Fort Worth, TX 76116; 817/244-6898; www.painlessperformance.com



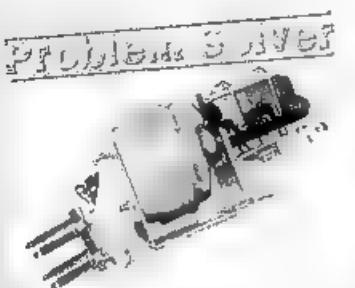
CHEVY BLOWER

If you installed a late-model Chevy Vortec V-8 in your Grand Sport, you may want to consider one of these new Kenne Bell superchargers. The new blowers feature the Blowzilla 2.2 twin-screw, positive-displacement configuration with full boost on tap from just 2,000 rpm. The blowers are said to produce up to a 50-percent increase in horsepower and torque. Contact: Kenne Bell Superchargers, Dept. KC, 10749 Bell Ct., Rancho Cucamonga, CA 91730; 809/941-6646.



COMPAC A/C

Vintage Air has introduced a new generation of advanced climate-control technology, beginning with a new GEN II Compac System. The new evaporator features servo-motors to operate A/C functions instead of vacuum actuators, thus delivering a greater range of control and reliability. The design additionally features improved heat and defrost operation, along with OEM-style temperature adjustment and true bilevel operation. The GEN II Compac comes complete with an evaporator, mounting brackets, standard controls and wiring, an A/C duct hose, vent louvers, a drain kit, and a heater control valve. Contact: Vintage Air, Dept KC, 10503 I.H. 35 N., San Antonio, TX 78233; 800/862-6658; www.vintageair.com.



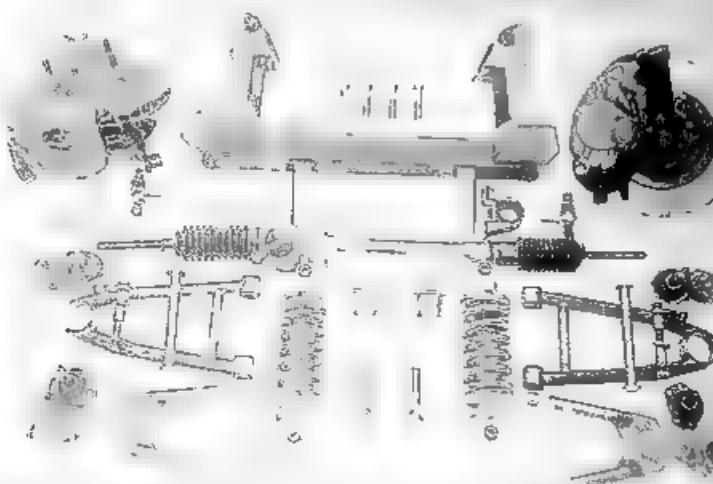
REMOTE MOUNT MASTER CYLINDER

Ki cars are often short on space, so products that address difficult installations are always welcome discoveries. C.H. Topping offers this remote-mount master cylinder/booster that can be mounted virtually anywhere in the car. The remote-system kit can be tailored to your brake-system needs by providing any bore-diameter master cylinder and any diameter booster. The kit comes with a universal mounting bracket and uses your existing system—boosted or not—to operate the larger remote system. Contact: C.H. Topping Company, Dept. KC, 520 W. Esther, Long Beach, CA 90813; 562/432-0901; www.chtopping.com.

DUAL-QUAD AIR FILTER

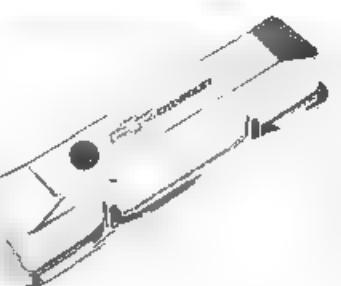
Need a tried-and-true hot-rod air cleaner? Check out this hot-tracking filter from K&N. This unit is from their Stage II line and is available in white polished finish. The new assembly fits GM Tech-II 1600ci quad-carb setups with the GM track-beamer, center-to-center/differential. Installation is a snap. Call 800/642-3447 for details.

KN-1000
K&N Stage II
Hot Tracking
Dual-quad
Air Filter
White Polished
1600ci GM Tech-II
quad carb
GM track-beamer
center-to-center/differential
Installation is a snap
Call 800/642-3447 for details
www.knfilters.com



IFS KITS

Jim Meyer Racing offers these new independent front suspension kits for kit cars. The Stage II kit features all the components you'll need to install an IFS system, including rack-and-pinion steering and disc brakes. The economical Stage I kit allows you to locate all the necessary spindles, balljoints, brake parts, and steering, while Meyer provides the crossmember, coilovers, A-arms, and rod ends. Also available as options are power racks, chrome A-arms, steering columns, and linkage kits. For applications and details, contact Jim Meyer Racing, Dept. KC, 1345 SE 23rd, Lincoln City, OR 97367; 800/824-1752.



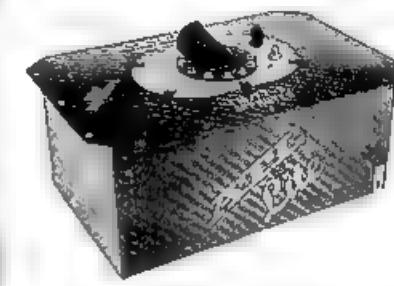
PREMIUM CHEVY VALVE COVERS

Made for '58-'86 Chevy small-block engines, these premium valve covers will nicely dress up the engine compartment on your car. Bearing the red Bow Tie emblem and Chevrolet lettering, these tall-style, die-cast aluminum valve covers are equipped with GM-designed, oil-restricting internal baffles and overhead oil drippers for pinpoint valvetrain lubrication. The valve covers are available in three versions: polished, black crinkle, and chrome plated. Available from PROFORM Factory Performance Parts, Dept. KC, P.O. Box 306, Roseville, MI 48066; 810/774-2500; www.proformparts.com.



SOUND, HEAT, AND VIBRATION DAMPING

Sesche Industries' Accumat materials are available to suppress sound, heat, and vibration. Accumat is flexible, doesn't require heat for adhesion, is flame and chemical resistant, and can withstand temperatures from minus 40 to plus 250 degrees. It can be used for interior panels, trunks and doors, under carpet, and as a headliner. For applications, contact Sesche Industries, Dept. KC, 1155 Pacific Ave., Channel Islands, CA 93033; 805/363-4420; www.sesche.com.



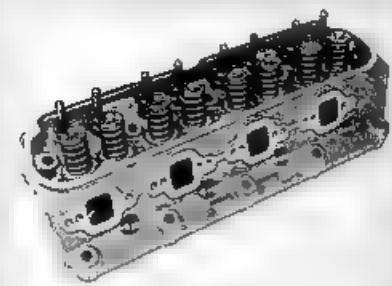
FUEL CELL

Aero Tec Laboratories (ATL) has just released this neat Ultra-Lite racing fuel cell. The ATL Lite begins with a thin FT3 5 NASCAR-approved Aramid bladder. It also includes new light-weight safety foam, a cross-drilled nut ring, an aluminum fill plate with flap-valve, and simplified aluminum fittings. The cell is encased in a carbon-fiber container. This new cell chops 50-65 percent from the weight of a standard fuel-cell system. Contact: ATL, Dept. KC, Spear Road Industrial Pk., Ramsey, NJ 07446-1251; 201/825-1400.



BATTERY HOLD-DOWN

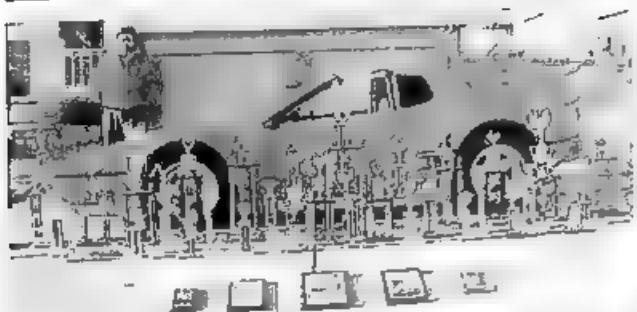
Holley Performance Products offers this cool battery hold-down called the Annihilator. It's designed to fit the company's Annihilator Race Cell compact battery. The hold-down is fabricated out of 6061-T-6 aircraft-quality aluminum and is polished. It weighs just 3.7 pounds and can be mounted virtually anywhere in the car. Contact Holley Performance Products, Dept. KC, P.O. Box 103, Bowling Green, KY 42102-7360; 800/HOLLEY-1; www.holley.com



ROUSH 5.0 HEADS

World Products, in collaboration with Roush Racing, has developed a new cast-iron cylinder head for small-block Ford engines called the Roush 200. The new heads are 50-state-legal street components based on racing technology. Features include 200cc intake runners and 64cc "fast-burn" combustion chambers. These heads are compatible with factory pistons and valvetrain components and are said to deliver substantial performance improvements. They are offered as bare castings or complete, ready-to-install assemblies, with choices of three valvespring options to tailor the heads for use with hydraulic, hydraulic roller, or mechanical roller-cam setups. For more info, contact: World Products, Dept. KC, 35330 Stanley, Sterling Heights, MI 48312; 810/939-9628; www.worldcastings.com

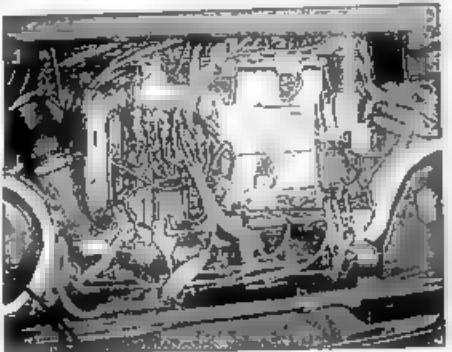
SHOW-OFF



TROPHY WINNER

*Guy Naser
Omaha, NE*

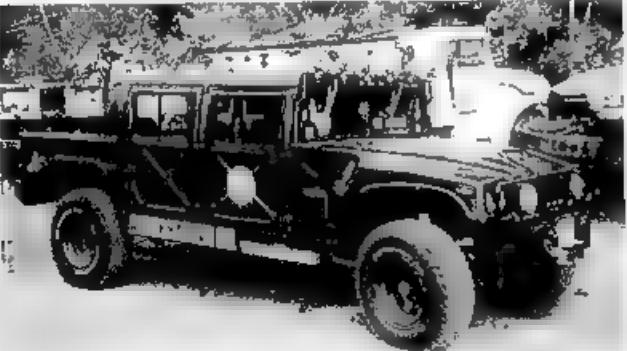
Even though you can't see the forest for the trees here, Guy Naser's Contender is a really nice build. He tells us that much of what he learned on the pages of *Kit Car* went into building this hottie. Guy enlisted the help of Design One Systems, PISA, and Mr. Mike's for his summer driver. The car is powered by a 2.8 V-6 helped along with a Design One turbo-charger. Guy already has two more kits awaiting build time and is seriously considering a Northstar swap in the next car.



SQUIRE SKIMPY

*Dan Danley
Woodland Park, CO*

Dan Danley writes, "This car is a copy of a '35 Squire Skimpy. The Squire Car Manufacturing Company produced seven cars, two in the Skimpy racing style. Both of those cars still exist in England. My car was built on a '60 Peerless chassis. The Peerless was a fiberglass-bodied car built in England using a Triumph TR-3 engine, transmission, and front suspension with a custom-made DeDion rearend. The Peerless tubular frame was extended by 14 inches to place the front axle in front of the radiator. The body panels were fabricated from fiberglass, aluminum, and steel. The 18-inch wire wheels were built in England by my specifications. Construction took about three years." Nice job, Dan.



RAT ROD

*James Ruseborough
Fitchburg, MA*

James Ruseborough sent us some shots of his nicely built Classic Roadsters (now called Badlands) R.A.T., which looks as if it's ready to terrorize some Third-World countries. The truck took about a year of weekends and includes a custom interior with power bucket seats, dash gauges, a center console, power locks, and a stereo system. He mounted a honkin' 8,000-pound winch and a full front brush guard, a brace of off-road driving lights, a tow package, and an onboard air system. The drivetrain is a '72 Chevy small-block bored 0.030 over, fitted with a mild cam, and an Edelbrock intake and carburetor.



AZTEC TRADITION

*Chris Guenther
Arvada, CO*

Chris Guenther admits to having been enamored of the Aztec 7 ever since he was a kid. He likes concept cars, and to be able to own one for real—if a replica—couldn't be much better. Chris actually owned two Aztecs at the same time, but finding a windshield for his spare car turned out to be a pricey proposition. You see, they used Lamborghini Miura glass. Chris sold his spare Aztec to a fellow Rocky Mountain Handcrafted Automobiles club member so he could concentrate on updating his driver. The car is VW powered, complete, and ready to hit the road just about any time.



THREE'S COMPANY

*Theodore Pugh
Sophia, NC*

Theodore Pugh wanted to show us that if one kit car is good, three must be excellent. Pictured from left to right are an Alpha 250 GTO built on a '78 Datsun 280Z, a Callaway Camaro, and a Miata Italia. All three cars were professionally built and are driven as much as possible. The GTO was built in 1985 and has been driven 175,000 miles without problem. Thanks for sharing your stable with us, Theodore.



ZERO HANDICAP

*Butch Cooke
Boone, NC*

We received a note from David Thompson—not about his own kit car but that of his friend, Butch Cooke. Butch called David to see if he would be interested in helping with the build of a Shell Valley Cobra replica. The result is the handsome snake you see here. The pair completed the car in about five months, with a 460 big-block mated to a C6 trans and hand controls. David says the big story with this car is not the car itself, rather it's Butch's I-can-do-anything attitude toward everything. This Cobra is testament to Butch's perseverance—and we might add, skills.



THAT SINKING FEELING

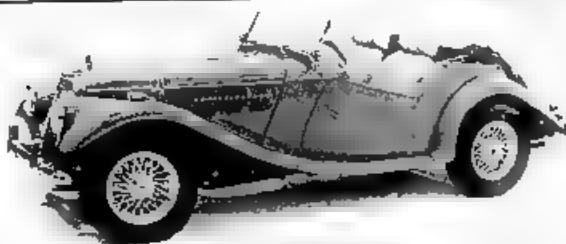
*Gil Lipscomb
Bluewell, WV*

Gil Lipscomb tells us his new, fully loaded '88 Fiero was stolen eight months after he bought it. It was recovered—after the thieves ran it down a launch ramp into the backwaters of Savannah where it sat submerged for three days. He bought it back from the insurance company, bought a copy of *Kit Car*, and with the help of V-8 Archie, Summit Racing, and others, he began transforming the car into what you see here.

KC

We want to see your car! All you have to do is send us a good photo of your kit car and a brief explanation of what it's all about. You might also want to include some personal background and any anecdotes about building or owning your car. Send entries to *Kit Car Show-Off*, 6420 Wilshire Blvd., Los Angeles, CA 90042.

KIT TECH



VW WHEELS

I am looking for Cobra-styled knock-offs or wire wheels to fit my '72 Karmann-Ghia. Do you know any source for four-lug wheels and adapters for the 140mm pattern and 15x5 or 15x7 wheel size?

Jim Huddleston
via e-mail

You're in luck! Dayton Wire Wheels (800/862-6000) can provide adapters and wire wheels to fit the Ghia. The company makes a variety of wheel rims, lace styles, and knock-offs that you can see on the company's Web site (www.daytonwheel.com). For Cobra-style alloy wheels, try PS Engineering (310/534-4477). PS has blank adapters that it can drill to match your bolt pattern, and it sells replicas of all three original Cobra wheels. The 427S/C is a replica of the wide (7.5 inches front/9.5 inches rear) wheels used on the S/C. It also carries the "Kidney Bean" wheels used on the early 260 comp cars and the 289/427 FIA wheels. These last two styles are available in narrower rim widths (6.5 inches). Find them on the Web at www.cobra427sc.com/ps/intro.htm.



RECENT CONVERT

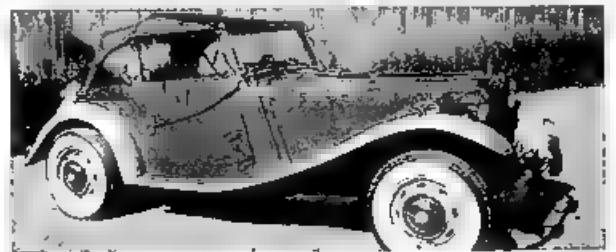
I have seen the Annual Kit Buyer's Guide in *Kit Car* magazine. I had thought it was just a useless magazine, but when I opened it, it was so cool! The cars are really nice. But I have some questions. What is a "turnkey"? Do body kits look exactly like the original Lamborghinis or Cobras? When you buy a body kit, are items such as the door hinges or lights included? I want to build my own kit car—and I'm a fan of *Kit Car* now.

Dennis Lansang
Mesa, AZ

Thanks, Dennis, we're glad to have you on our side. A "turnkey" is a fully completed kit car that the buyer has merely to "turn the key" and drive away. Most kit car companies can either assemble the car for you or recommend a shop that can. A "rolling chassis" is a kit that is fully assembled except for the engine and transmission. These are usually upholstered, painted, and wired. A "pallet car" is a vague description and can vary from manufacturer to manufacturer. Usually this is a complete kit with all components included so you don't have to scrounge

parts from junkyards. Most kit manufacturers will also sell you just the bare body without even the doors cut out. These are intended for those with lots of experience who are building their own chassis from scratch. Unless you like doing bodywork, try to get a kit with the doors already hung (an option on most). This is one of the hardest parts to get right. The door hinges, lights, and so on are usually included in a hardware package. These are standard on the more complete kits and optional on the basic (cheaper) models. Be sure to ask since these items can add up fast.

Some kits are a lot more authentic than others. For instance, Lambo replicas can be built for reasonable money on a standard-wheelbase Fiero chassis. However, this leaves the car about a foot shorter than an original car. Most Lambo and Ferrari replica manufacturers also offer kits based on "stretched" Fiero chassis that have been cut apart and lengthened. They look better when viewed from the side but cost a lot more. Many Cobra replica manufacturers stretch their kits out from the original 90-inch wheelbase to gain legroom (which the originals were short on). They may then widen them as well so the proportions look better. Although some kit cars use the exact same trim pieces as the original Cobra, Lambo, or Ferrari, many substitute similar trim items that are less expensive. For instance, some Diablo kits use a Pontiac van windshield in place of the Lambo glass. This is cheaper and not noticeable unless you're a die-hard Lambo expert. Actually, one of the neat things about kit cars is that you don't have to repurchase anything you don't want to. Just because real Lamborghinis never had gold-plated instruments or triple-lace wire wheels doesn't mean you can't indulge your own fantasies on your kit.



TOP IT OFF

I'm looking for a place that manufactures pre-made convertible tops for kit cars. I have a '55 MG London Roadster with a top that attaches to a tube frame. Some people have told me there are tops you can buy and install yourself. Is that true?

Rick Lumbach
Monroe, NJ

Unfortunately, if the manufacturer of your kit is no longer in business, you will probably have to get a top custom made. You can buy replacement tops for real MG-TDs from Moss Motors (800/667-7872), but they are unlikely to fit correctly on your kit car. There were quite a few kit manufacturers making MG-TD replicas in the '80s and each made their own version of the windshield, top, and frame, so they will seldom interchange with each other or the original car. If you still have your old, tattered top then take it—and the car—to an auto upholstery shop and have them make you one from vinyl. If you don't have an old top, then take a scrap bedsheet and cut, stretch, and tape it over the frame so the shop will know what you want your new top to look like.

www.kitcarmag.com

kit cars, as well as listings for swap meets across the country. We strongly recommend you join a local kit car club and attend its events. You may find someone who needs a hard finishing their kit, and this is a free way—plus burgers and pizza—to get your feet wet. Best of luck!

SPYDER WE?

I've noticed the tread and wheelbase of a Fiero are not far off those of some Porsche Spyder (550 and RS61) replicas. Has anyone considered mounting one of these bodies on a Fiero donor? Would the Fiero's front and rear cowl locations seriously misalign with the equivalent parts of the Porsche-replica shell?

Don Roger
Ontario, Canada



NEW OR USED?

I am interested in getting into kit cars and/or restoration, but I'm very much an amateur. At this point I believe it would be too overwhelming for me to attempt to complete a whole kit from scratch. Would it be wiser to find a partially completed kit car, or restore a kit car or an original car, so that I could get my feet wet? How would I find such cars. How do I find out where and when swap meets occur?

Trey Teel
via e-mail

We wish there was an easy answer for you. If you buy a new, simple kit car—such as a standard-length Fiero rebody or a VW-based kit—from a reputable company, you get the huge advantage of having someone you can call when things go wrong. You will also get an assembly manual and maybe a video to help out. And if you break something, the company can sell you a replacement. If you buy an older kit, make sure it was made by a reputable company that is still in business so you can get advice and parts. What you do not want is a partially completed kit built by a fly-by-night kit builder. Odds are good that some of the parts are missing, others may not have been assembled correctly, and there is no one to hear you scream. Some kits are virtually build-proof.

If you would like to restore an older kit—as we are doing with our project Devin—look for one that has been fully completed, drivable, and perhaps in need of a cosmetic and/or mechanical overhaul. Remember, if you can't drive it, you must assume all the running gear (engine/transmission brakes!) are toast.

If your goal is to build kit cars, then there is no need to restore an original car first—you can learn the same lessons on a kit car. Older kit cars require you to do a lot of research, so make friends with the guys at the local parts stores. Get used to hearing phrases such as "Whadaya mean ya don't know what the part came off of?"

Some of the most simple kits are VW-based buggies and sports cars because the chassis work and engine mounting is done for you, and parts are readily available and reasonably priced. Avoid kits powered by oddball engines, such as the Chevy Chevette, or that require you to modify or lengthen a chassis. Once you have some experience, you can take on tougher projects, but starting out with an overly complicated kit could kill your enthusiasm for this challenging hobby.

As for finding the kit of your dreams, pick up a copy of Hemmings Motor News at your local newsstand, or check out www.hemmings.com. Hemmings has pages of ads for

and rear cowl locations seriously misalign with the equivalent parts of the Porsche-replica shell?

Don Roger
Ontario, Canada

Funny you should mention that John Austin at Austin Conversations (817/439-1559), partner in the keen Design One Northstar-Fiero swap, is in the process of fitting a Perry Design 550 Spyder body to his personal Fiero/Northstar rocket ship at this moment. Austin says he picked the Perry body over the Beck 550 because it was longer and wider. However, he counsels that a project of this scale is not for the faint of heart.

For starters, Austin did away with the Fiero chassis and made his own tube frame. In front, he narrowed the Fiero suspension by 3 inches to keep the tires from sticking out too far (he will still have to put 2-inch flares on the front fenders). In back, the Northstar will take up most of the rear bodywork. Austin was not enthusiastic about using the Fiero chassis for this project. It is too tall and would require a radical cut-down, at which point it would have the rigidity of a water-soaked cracker box. If you have a scrap chassis to play with, Austin recommends welding in extra bracing along the sides to stiffen it up before cutting off the top. Since the 550 has much higher doorsills than the Fiero, there would be room to do so.

Unless you have an engineering background and are an accomplished welder/fabricator, this project is probably not a good idea. If you love the 550 body, build a VW-based version, or have Austin build you one of his chassis!

LATEST TRIUMPH

I would like to put an American engine in my '72 Triumph TR6. Perhaps a Chevy 350, or if that would be too large and would throw the car off balance, then maybe a Chevy/Buick 3800. Basically, any large American motor that I could easily and economically get parts for and that would rumble like hell would be fine. I'd really like to make my own Shelby AC Cobra.

I'm looking for a kit—or a machine shop that could assist me in making this swap. A friend suggested looking to your magazine as a first research source. He also referred me to a friend who could do the welding along with some crazy stuff I'm not ready for.

Also, what would be the best way to get an engine used or a crate motor?

KIT TECH

Engine swapping into the TR6 can be done. We've seen a hot 289 Ford and a Jag V-12 shoehorned into the Triumph chassis. However, neither were matches made in heaven. The Jag version was an ill-handling barge and the FoMoCo version broke the rear suspension, resulting in a roll-over. You will need a small, light V-8 such as the Ford 5.0 coupled to a Ford five-speed box.

A crate motor is a good idea unless you know enough to evaluate junk-yard mills (get a stock one, not a fire-breather). The Chevy 350 is too big, while the 3800 is not enough of an improvement over the TR engine to be cost-effective. If the engine is too powerful, the rear suspension will not hold up, and the chassis will need to be beefed up—urethane bushings, bigger tires, stiffer sway bars, different springs and shocks, and a sturdy rollbar for starters.

Other work needed includes fabricating engine and transmission mounts, having a custom driveshaft made, cutting the firewall for clearance, modifying the shift linkage, making an exhaust system from scratch, fabricating a more efficient cooling system (use an aluminum radiator), fabricating a clutch release mechanism, and piecing together a wiring system combining the Ford and Triumph harnesses. As long as you keep it on the street, the brakes should be adequate—but just.

Alternatively, consider finding a good Triumph shop and having the TR6-banger hopped up—maybe a cam, some porting, a loud muffler, and a set of Webers. It would save you a fortune in fabrication costs, sound great, and not hurt the resale value of your car (which the engine swap will destroy). As a rule of thumb, estimate all your expenses and the time it will take and double both figures—that should be close. If, as you say, you want to have a Cobra, you would be better off selling the TR (in good condition it's worth around \$7,000-\$10,000) and buying a new or used entry-level Cobra replica.

If your car is rusty, don't even think of putting a V-8 in it!

FORMULA FOR DISAPPOINTMENT

I am interested in knowing how to increase horsepower and gas mileage. I have an '88 Fiero Formula with the 2.8 V-6 and an automatic.

I was thinking about lowering the spark plug deeper into the head by about a half inch, lowering the cold

start valve about 6 ohms, increasing airflow from below the car, opening up the muffler, and adjusting the torque converter lockup sooner.

I would also appreciate it if you could put me in touch with a Fiero club or a Lamborghini kit car club.

Guy Augustino
New Castle, PA

Sorry, Guy, but we can't be too encouraging on your prospects with the 2.8. A much-modified street 2.8 puts out around 230 hp and will require substantial work (\$\$\$) to get there. Not only that, but it will also probably not be emissions legal and mileage will go down.

The only things that seem to help are Hypertech PROMs (available from the Fiero Store at 860/684-6762). The "automatic" version will raise the converter lock-up speed and the redline at a cost of around \$100. Hypertech claims emissions and mileage are not affected, but don't get your hopes up—it will be better but not a giant step forward. You can also add a hotter bumpstick from Comp Cams (about \$100 plus rebuild costs) and gain some improvement. But your best bet for performance is a V-6 swap (A.C.E. 970/259-4156), though this probably won't help your gas mileage—a manual tranny would be better.

Adding air from below is unlikely to help much, although a K&N air filter would flow much better than other brands. Picking up air from below will give you a slightly cooler charge at the expense of more dirt and dust. Be sure to clean the filter more often. Lowering the plug will most likely result in a burned piston—don't try that one. Going to a less restrictive muffler won't help unless you make other changes in the engine—such as a hot cam or a turbo—where it is pumping more air.

As for a Fiero club, contact the Mid-Atlantic Fiero Owners Association (717/292-7647) or the Western Pennsylvania Fiero Club (724/744-1208). And be sure to attend the Carlisle Kit Car Show on May 18-20 when all the Fiero and kit car clubs in Pennsylvania will come out to play!

KC

Have a technical question about your kit project? Write to Kit Tech, Kit Car, 6420 Wilshire Blvd., Los Angeles, CA 90048, or e-mail us at kicar@emapUSA.com.

E-mail Note: Please include your name and address in the body of your e-mail so we know who we're talking to.

Thanks!

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ALL PHOTOS FROM MOTOR TREND 1955

THE AMAZING ELECTRONIC LA SAETTA

The history of the automobile is littered with the carcasses of great ideas. This month we're going to talk about two of them—one is a kit car builder of limited success and the other is the most outrageous vehicle propulsion idea ever!

Our story begins in 1952, when brothers Gino and Cesare Testaguzza introduced a fiberglass body of their own design and construction. This Chevy sedan-based prototype received a great deal of attention in Detroit since the two had worked in the styling departments of various major manufacturers. The prototype was called the La Saetta ("Bolt of Lightning") and was designed to fit American car chassis with 110-116-inch wheelbases. It weighed only 175 pounds and was a two-seat sports car with restrained fins on the back and a removable hardtop.

After trying unsuccessfully to interest Detroit manufacturers in buying the concept, the Testaguzzas elected to go into production on their own. They set up a plant in Ogden, Michigan, and announced plans to build five bodies a day. Kits were to cost \$1,000 and turnkeys with Chevy running gear were advertised for \$1,800. They offered many options in grilles, taillights, and instrument panels. Although the kits remained in

production until 1956, I have never heard of a survivor. Anyone have one?

At this point the La Saetta would be just another failed kit car company if not for a bizarre series of articles that appeared in *Motor Trend* magazine in 1955. A La Saetta-bodied prototype was shown by the Electronic Motor Car Company in Salt Lake City, Utah. The prototype was a hybrid (then called a "turbo-electric") vehicle with a small gas engine to charge up the 80-cell battery system that powered the electric motor. The motor in the prototype was connected to a conventional rear axle by a short prop shaft. In the production model, the motor was to be placed in the rear axlehousing and coupled to an electro-magnetic limited-slip differential with regenerative braking.

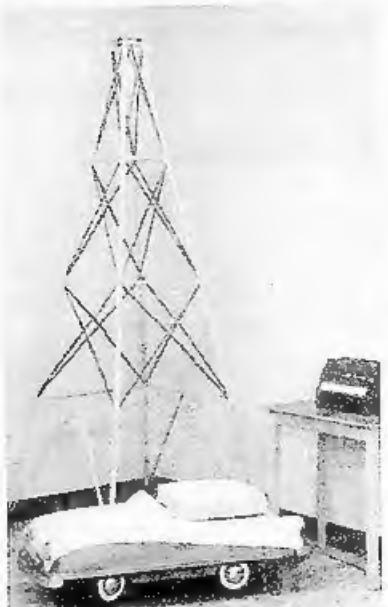
Regenerative braking later became standard fare on electric cars as it allowed the motor to convert into an auxiliary brake and pick up energy when coasting. The hybrid technology

is basically the same as the Toyota Prius that is now on the road—46 years later.

The gasoline-powered generator was up front where the radiator would have been on a V-8-powered model. The engine space was taken up by the battery stash, but production plans called for the frame to be molded to hold the batteries. The La Saetta body was a two-seat sports model, but Electronic intended to have a five-passenger sedan on the production lines first. Electronic also had a conventional V-8-powered La Saetta on hand with which to compare their prototype.

Motor Trend's Jim Lodge drove the car and reported that it felt like a large amusement-park ride. He had been warned by Electronic's head engineer, Tom Judd, to be careful when he hit the accelerator as the Electronic produced maximum torque at startup, giving surprisingly quick initial acceleration. No doubt the car was a working prototype.





TECHNO-TRANSISTORIZED

OK, so there was a gas-electric hybrid with a fiberglass kit body in 1955. That's nothing. Here's where it gets interesting.

According to company President F.B. Malouf, the gas engine was not intended to be a permanent installation. After a sufficient number of Electronics had been sold, the company intended to dot the landscape with transmitting towers pulsing a signal, which would be picked up by receivers that would replace the gas engines. The receiver would convert the signal into a current to replenish the batteries. The towers would not need to be in line-of-sight locations. They would emit a beam-type signal that would work in conjunction with other towers to produce an "umbrella" pattern, blanketing areas where the cars could be operated. Electronic said the signal would not interfere with television, but the FCC might have felt otherwise. After all, this was basically the same system on which transistor radios worked.

To pay for this network of towers, owners would rent—from Electronic—a special tube that went in the receiver. Shades of *Buck Rogers* or *Fireman Theater*? Without it the transmitter would not work. Owners could still charge their batteries at home and have a short operating range (some things never change), but they would not receive their trickle charge as they drove around. The tube was specially designed to

prohibit the unscrupulous from tapping into all that pulsating power for other uses. The charge for the power would depend on how many Electronic owners were out there—the more customers, the less each would have to pay. Electronic estimated the cost would work out to about 9 cents per 20 miles, battery life was estimated at 10 years, and all components were modular for easy replacement.

A model car was rigged with a tiny motor, battery pack, and transmitter that received signals from a miniature tower. It magically buzzed away to impress journalists, but despite grandiose marketing plans, the full-size Electronic never made it into production (what a shock). What happened to the prototype is unknown, but I would love to find that little model.

LETTERS TO KIT CARCHIVES

KELLISON QUERY

Can you help me establish a fair price for my kit car? I have a Kellison J-6 with a Chevy 350/automatic. It has about 13K on it. Do you know of any J-6s that have sold during the last few years? I first registered this car in 1963 and am pretty sure that not many were finished before Jim Kellison went out of business. I have been told my car qualifies for vintage racing and that gives it bonus value. What do you think?

Jim LoCodo
via e-mail

I really can't give you a value on your car, but maybe this will help. I have seen numerous Kellisons for sale in the last few years with prices ranging from \$1,500 for an unfinished project to a high of around \$25,000 for an extremely nice car. Bear in mind that these may not be the actual selling prices.

The Barrett-Jackson auction Web page shows three Kellisons selling for between \$6,700 and \$22,000 in the last five years. Be aware that Kellison coupes were also sold under the Astra and Allied names and that quite a few were built. There were two beautiful examples at the Knott's Berry Farm kit car show last year, and there is even a registry and a Web site devoted to them (www.kellisoncars.com) with ads for cars for sale.

As for vintage racing, the car must have period speed equipment throughout or it will not be eligible for most clubs. For instance, the 350/auto would have to go in favor of a 283 or 327 and a four-speed box. The brakes, suspension, and wheels should also be of period availability. Before preparing a car for any type of racing, be sure to obtain a copy of the rules for the

clubs with which you intend to run. If your car was raced when it was new, it would have more value than a street car that was recently prepared for vintage racing. In fact, there are a number of Kellisons currently competing in vintage racing across the country.

SAVE THE WHALE TAILS

I have been reading *Kit Car* for more than 10 years, and it's a great magazine!

Could you let me know of any past or present replicas of the Porsche 930 Turbo or RS racing car? I'm a longtime aficionado of flared-fender Porches, but I have never seen a kit dedicated to this model. Any info would make my day!

Cole Wood Sr.
Cleburne, TX

Back in the '80s, California Touring Coach sold 935 and Carrera RSR replicas that fit on a VW floorpan, but the company is no longer in business. Currently Indy Exotics (317/784-1119) sells 930-look-alike bodies. If you want real Porsche running gear, you can begin with an older 911 or 912 and add Turbo body panels from Better Bodies (619/690-5081). They sell a variety of noses, spoilers, and flares to turn standard Porsches into pseudo-930 and RS models. Fiber-Jet Industries (916/783-3198) also sells some "wide-body" panels for the 911.

KC

Got a kit you can't identify or would like more information on? Send in pictures (nonreturnable) and I'll take a shot at it! Mail to *Kit Car* Carchives, 6420 Wilshire Blvd., Los Angeles, CA 90048.



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If you buy a kit, you could end up spending extra time and money searching for parts that aren't included, but seemed to be when you ordered it. In the long run, you'll spend more time and money on a kit than on a new Superformance 427 S/C. We don't sell kits. We sell Cobras.

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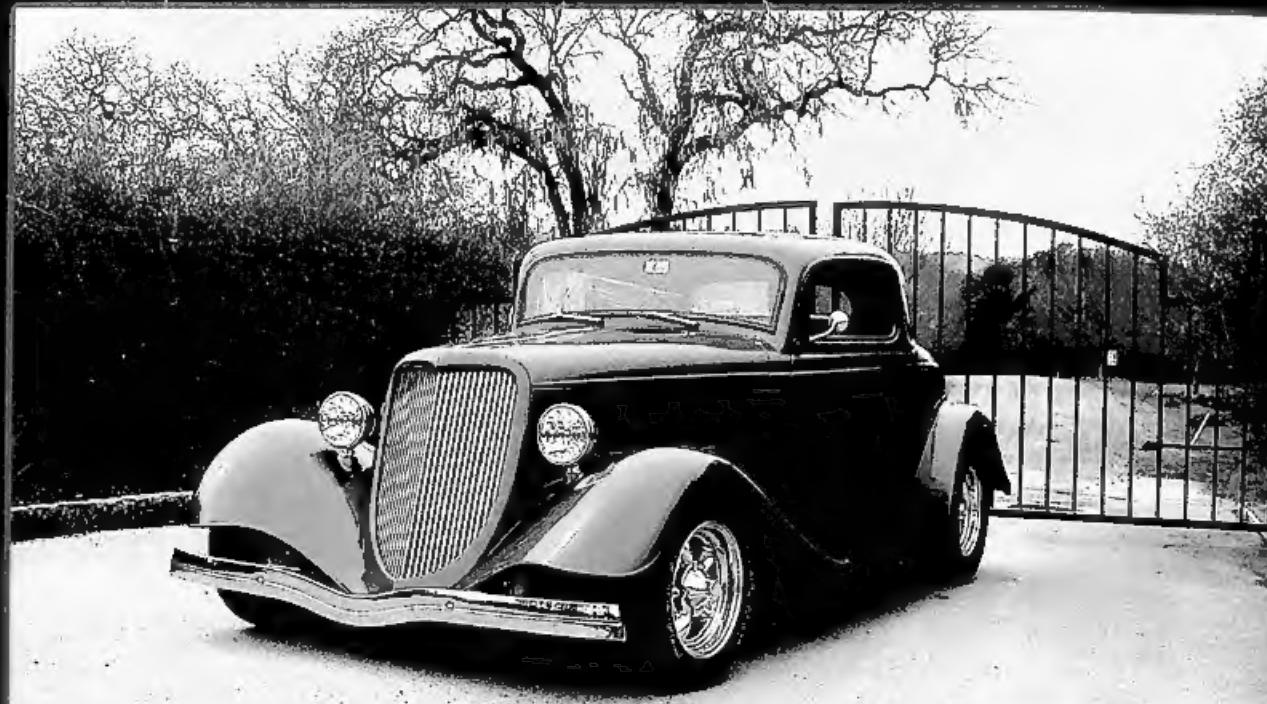
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